

TableView and DelegateChooser

new in 5.12

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ecloud on #qt-labs, #qt-quick etc.



About me

- Qt user since ~2004
- The Qt Company Oslo since 2011
- Pointing devices: touch, Wacom tablets
- Qt Quick Input Handlers
- Linux/X11 and macOS
- QtPDF
- Qt Quick Controls and Dialogs



Agenda

- Review of Qt Quick Controls 1.x TableView
- Introduction to Qt Quick TableView
- Comparison of model-view relationships
- Demo & walkthrough: refactoring of qps
- Remaining work



Qt Quick Controls 1.x TableView

advantages:

looks native on desktop TableColumn API

disadvantages:

performance (too many Items and Loaders)
loads all columns when instantiating a row
depends on data roles in the model

architecture:

QML declarations define the columns

PID	User	Pri	NI	Size	RSS	CPU	Memory	Time	Policy	Command	Current	worl
1	root	20	0	220 MiB	6 MiB	0.00	3 MiB	35s	TS	systemd	-	
2	root	20	0	0 bytes	0 bytes	0.00	0 bytes	1.1m	TS	kthreadd	(2)	
4	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	kworker/0:0H	-	
6	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	mm_percpu_wq	1.51	
7	root	20	0	0 bytes	0 bytes	0.00	0 bytes	10s	TS	ksoftirqd/0	-	
В	root	20	0	0 bytes	0 bytes	0.00	0 bytes	3.1m	TS	rcu_sched	(2)	
9	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	rcu_bh	-	
10	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.37s	FI	migration/0	8.78	
11	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.45s	FI	watchdog/0	-	
12	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/0	820	
13	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/1	-	
14	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.43s	FI	watchdog/1	1	
15	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.52s	FI	migration/1	-	
16	root	20	0	0 bytes	0 bytes	0.00	0 bytes	10s	TS	ksoftirqd/1	820	
18	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	kworker/1:0H	-	
19	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/2	7	
20	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.44s	FI	watchdog/2	-	
21	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.36s	FI	migration/2	(2)	
22	root	20	0	0 bytes	0 bytes	0.00	0 bytes	9.95s	TS	ksoftirqd/2	-	
24	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	kworker/2:0H	-	
25	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/3	-	
26	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.50s	FI	watchdog/3	(12)	
27	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.35s	FI	migration/3		
28	root	20	0	0 bytes	0 bytes	0.00	0 bytes	23s	TS	ksoftirqd/3	-	
30	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	kworker/3:0H	-	
31	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/4	(02)	
32	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.46s	FI	watchdog/4		
33	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.36s	FI	migration/4		
34	root	20	0	0 bytes	0 bytes	0.00	0 bytes	9.87s	TS	ksoftirqd/4	-	
36	root	0	-20	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	kworker/4:0H	(20	
37	root	20	0	0 bytes	0 bytes	0.00	0 bytes	0.00s	TS	cpuhp/5	-	
38	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.44s	FI	watchdog/5	-	
39	root	-100	0	0 bytes	0 bytes	0.00	0 bytes	0.37s	FI	migration/5	-	
40	root	20	0	0 bytes	0 bytes	0.00	0 bytes	9.84s	TS	ksoftirqd/5	820	
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The New Qt Quick TableView

advantages:

instantiates only the visible delegates
pools and reuses delegate instances
suitable for models that work with QTableView

disadvantages:

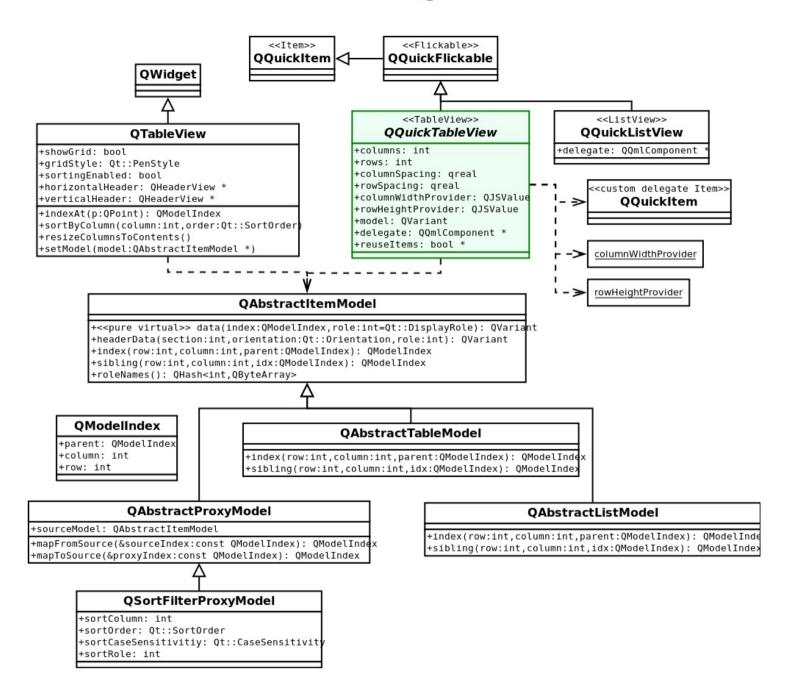
isn't a drop-in replacement for QQC1 TableView

architecture:

like a 2-dimensional ListView model (or proxy) defines columns, not data roles styling is entirely up to you (as with ListView)

1 root	20	0	220 MiB	6 MiB	0.0%	0.0%	35s	TS	systemd	-
2 root	20	0	0 bytes	0 bytes	0.0%	0.0%	1.1m	TS	kthreadd	-
4 root	0	-20	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	kworker/0:0H	-
6 root	0	-20	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	mm_percpu_wq	-
7 root	20	0	0 bytes	0 bytes	0.0%	0.0%	10s	TS	ksoftirqd/0	-
8 root	20	0	0 bytes	0 bytes	0.0%	0.0%	3.1m	TS	rcu_sched	-
9 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	rcu_bh	-
10 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.37s	FI	migration/0	-
11 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.45s	FI	watchdog/0	-
12 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	cpuhp/0	-
13 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	cpuhp/1	-
14 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.43s	FI	watchdog/1	-
15 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.52s	FI	migration/1	
16 root	20	0	0 bytes	0 bytes	0.0%	0.0%	10s	TS	ksoftirqd/1	-
18 root	0	-20	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	kworker/1:0H	-
19 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	cpuhp/2	-
20 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.44s	FI	watchdog/2	-
21 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.36s	FI	migration/2	-
22 root	20	0	0 bytes	0 bytes	0.0%	0.0%	9.95s	TS	ksoftirqd/2	-
24 root	0	-20	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	kworker/2:0H	-
25 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	cpuhp/3	-
26 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.50s	FI	watchdog/3	-
27 root	-100	0	0 bytes	0 bytes	0.0%	0.0%	0.35s	FI	migration/3	-
28 root	20	0	0 bytes	0 bytes	0.0%	0.0%	23s	TS	ksoftirqd/3	
30 root	0	-20	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	kworker/3:0H	
31 root	20	0	0 bytes	0 bytes	0.0%	0.0%	0.00s	TS	cpuhp/4	

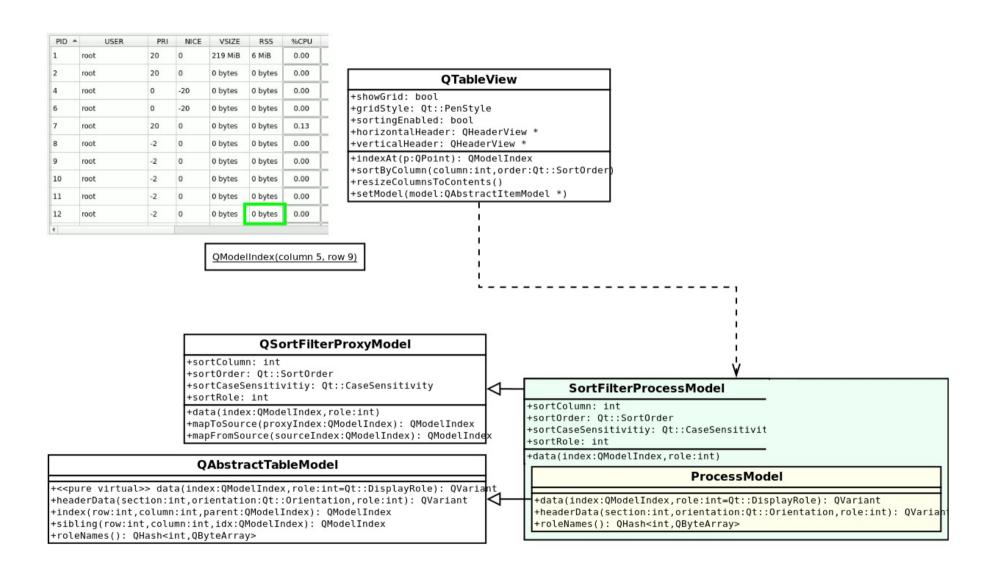
Class Diagram



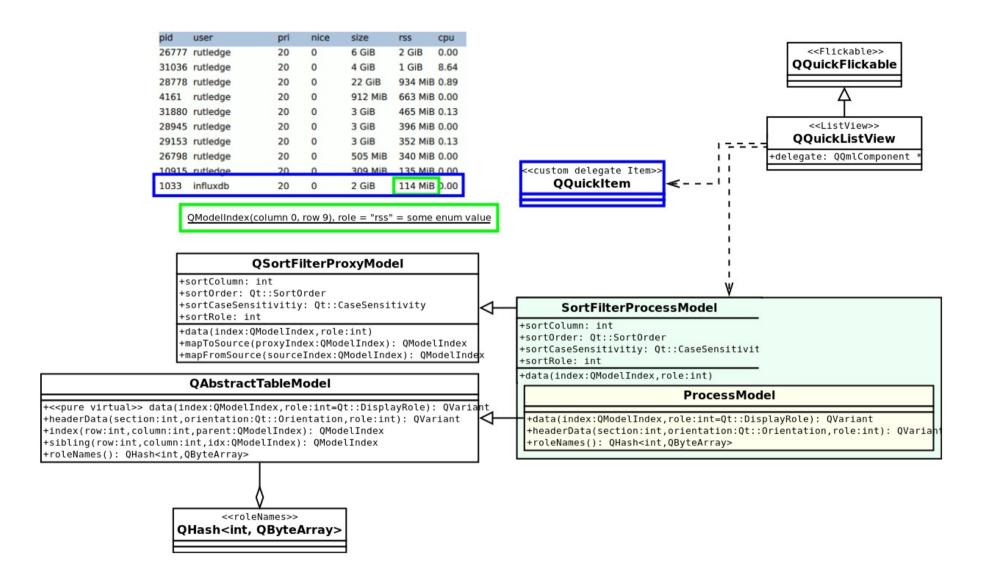
Three Views Sharing a Model nice size rss cpu 26777 rutledge 0.00 20 6 GiB 2 GiB 31036 rutledge 20 0 4 GiB 1 GiB 8.64 20 28778 rutledge 22 GiB 934 MiB 0.89 20 4161 rutledge 0 912 MiB 663 MiB 0.00 31880 rutledge 20 0 3 GiB 465 MiB 0.13 20 0 396 MiB 0.00 28945 rutledge 3 GiB 29153 rutledge 20 0 3 GiB 352 MiB 0.13 20 505 MiB 340 MiB 0.00 26798 rutledge 10915 rutledge 20 0 309 MiB 135 MiB 0.00 114 MiB 0.00 1033 influxdb 20 2 GiB <<Flickable>> OModelIndex(column 0, row 9), role = "rss" = some enum value QQuickFlickable PID A USER VSIZE RSS %CPU root 219 MiB 6 MiB 0.00 <<TableView>> <<ListView>> root 0 bytes 0 bytes 0.00 QQuickTableView 5 2 2 **QQuickListView OTableView** 0.00 root 0 bytes 0 bytes +columns: int +delegate: QQmlComponent ⊦showGrid: bool +rows: int -20 0 bytes 0 bytes 0.00 gridStyle: Qt::PenStyle +columnSpacing: greal +sortingEnabled: bool 0.13 root 0 bytes 0 bytes +rowSpacing: greal +horizontalHeader: OHeaderView * <<custom delegate Item>> +columnWidthProvider: QJSValue root 0 bytes 0 bytes 0.00 +verticalHeader: QHeaderView * **QQuickItem** +rowHeightProvider: QJSValue +indexAt(p:QPoint): QModelIndex 0 bytes 0 bytes 0.00 +model: QVariant +sortByColumn(column:int,order:Qt::SortOrder 0.00 +delegate: QQmlComponent * 10 root 0 0 bytes 0 bytes +resizeColumnsToContents() +reuseItems: bool * +setModel(model:QAbstractItemModel *) 11 root 0 bytes 0 bytes 0.00 columnWidthProvider 12 -2 0 bytes 0 bytes 0.00 rowHeightProvider QModelIndex(column 5, row 9) USER 2 root 20 0 bytes 0 bytes 0.0% 4 root 0 bytes 0 bytes QSortFilterProxyModel 0 bytes 0 bytes 0.0% +sortColumn: int 0 0 bytes 0 bytes 0.0% +sortOrder: Qt::SortOrder 0 0 bytes 0 bytes 0.1% +sortCaseSensitivitiy: Qt::CaseSensitivity SortFilterProcessModel 9 root 0 0 bytes 0 bytes 0.0% +sortRole: int 10 root 0 0 bytes 0 bytes 0.0% +sortColumn: int +data(index:QModelIndex,role:int) +sortOrder: Qt::SortOrder 0 0 bytes 0 bytes 0.0% +mapToSource(proxyIndex:QModelIndex): QModelIndex +sortCaseSensitivitiy: Qt::CaseSensitivit 0 0 bytes 0 bytes 0.0% 12 root +mapFromSource(sourceIndex:QModelIndex): QModelIndex +sortRole: int +data(index:QModelIndex,role:int) **QAbstractTableModel** QModelIndex(column 5, row 9) ProcessModel +<<pure virtual>> data(index:QModelIndex,role:int=Qt::DisplayRole): QVariaht +headerData(section:int,orientation:Qt::Orientation,role:int): QVariant +data(index:QModelIndex,role:int=Qt::DisplayRole): QVariant +headerData(section:int,orientation:Qt::Orientation,role:int): QVarian +index(row:int,column:int,parent:QModelIndex): QModelIndex +sibling(row:int,column:int,idx:QModelIndex): QModelIndex +roleNames(): QHash<int,QByteArray> +roleNames(): QHash<int,QByteArray>

11:08

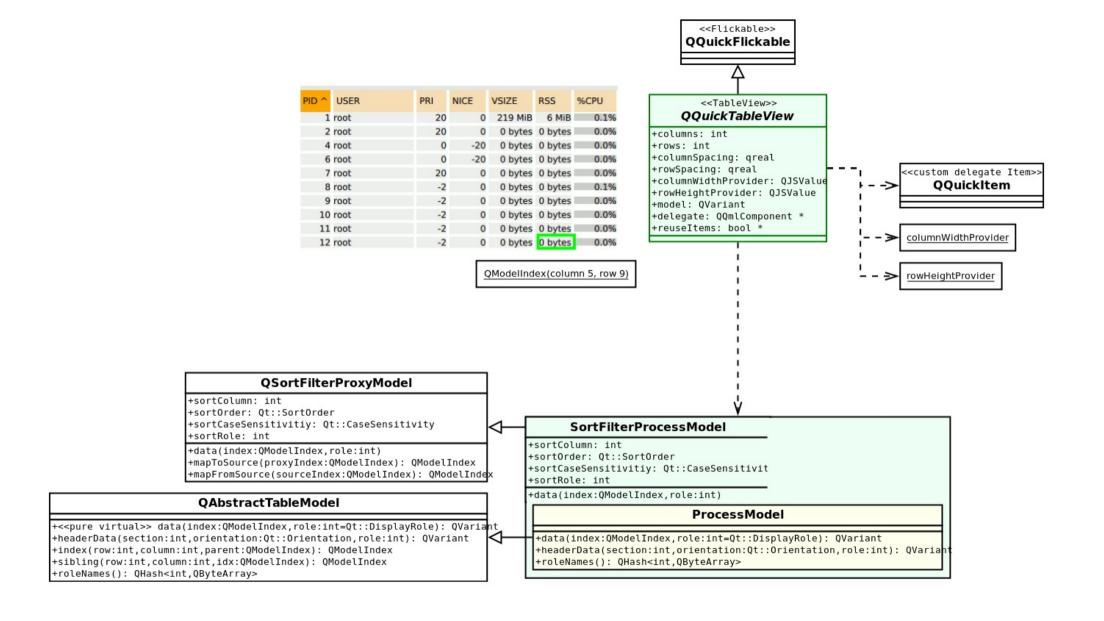
How QTableView accesses the model



How ListView accesses the model



How TableView accesses the model



qps

- Qt 'top' / process explorer application (started ~1997)
- part of LXQt desktop now https://github.com/lxqt/qps
- my fork for this presentation: https://github.com/ec1oud/qps

Stuff left to work on

- Header view
- Resizing columns
- Selection
- Decorations and styling
- QML TableModel (QTBUG-70334)
- QML ProxyModel (QTPM-1327)

TableView and DelegateChooser

new in 5.12

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This presentation:

https://github.com/ecloud/qt-presentations/tree/tableview