Rollups benchmarks

Benchmarking exec units as a function of “update length”

Preamble

In[267]:=

```
SetDirectory[NotebookDirectory[]];
```

Reference protocol parameters (June 2023)

In[268]:=

```
maxExSteps = 10 000 000 000;
maxExMem = 14 000 000;
```

Import benchmark data

In[270]:=

```
data = Import["rollupBench_1.csv", "CSV"];
```

Data analysis

CPU

In[271]:=

```
cpuData = {#[[1]], #[[2]]} & /@ data
```

Out[271]=

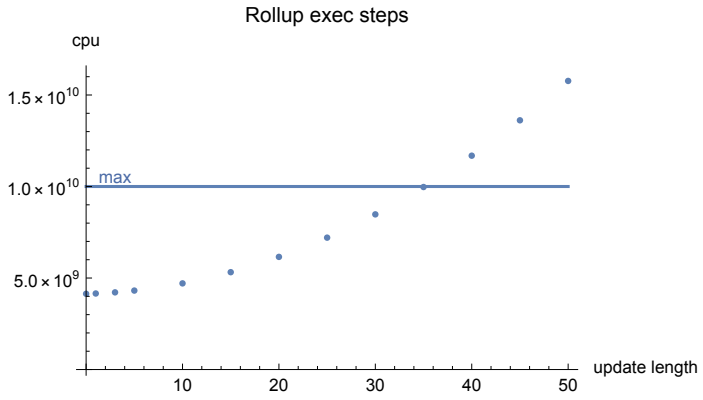
```
{{0, 4 138 976 405}, {1, 4 154 401 433}, {3, 4 216 937 683},
 {5, 4 314 213 975}, {10, 4 707 636 495}, {15, 5 319 119 315}, {20, 6 155 270 185},
 {25, 7 206 198 255}, {30, 8 478 428 175}, {35, 9 972 250 795},
 {40, 11 683 925 965}, {45, 13 616 902 985}, {50, 15 768 397 355}}
```

Data plot (CPU)

In[272]:=

```
ListPlot[cpuData, PlotRange → All,
  PlotLabel → "Rollup exec steps", AxesLabel → {"update length", "cpu"}];
Plot[maxExSteps, {x, 0, 50}];
Graphics[Text[Style["max", ■], {3, maxExSteps}, {0, -1}]];
cpuPlot = Show[%%%, %%, %]
```

Out[275]=



Reaching maximum budget

In[276]:=

```
FindRoot[Interpolation[cpuData][ul] == maxExSteps, {ul, 40}]
```

Out[276]=

```
{ul → 35.0865}
```

∴ CPU budget is exceded when *update length* is ≥ 36 .

Memory

In[277]:=

```
memData = {#[[1]], #[[3]]} & /@ data
```

Out[277]=

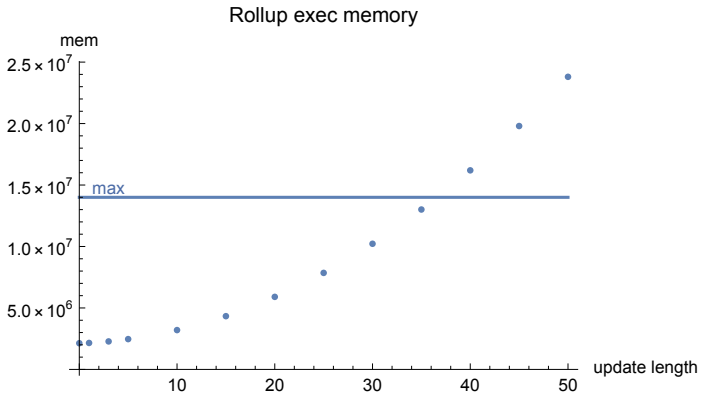
```
{{0, 2 131 374}, {1, 2 152 781}, {3, 2 277 851}, {5, 2 465 929}, {10, 3 199 284},
 {15, 4 331 439}, {20, 5 902 394}, {25, 7 852 149}, {30, 10 220 704},
 {35, 13 008 059}, {40, 16 194 214}, {45, 19 799 169}, {50, 23 802 924}}
```

Data plot (memory)

In[278]:=

```
ListPlot[memData, PlotRange → All,
  PlotLabel → "Rollup exec memory", AxesLabel → {"update length", "mem"}];
Plot[maxExMem, {x, 0, 50}];
Graphics[Text[Style["max", ■], {3, maxExMem}, {0, -1}]];
memPlot = Show[%%%, %%, %]
```

Out[281]=



Reaching maximum budget

In[282]:=

```
FindRoot[Interpolation[memData][ul] == maxExMem, {ul, 40}]
```

Out[282]=

```
{ul → 36.6269}
```

∴ Memory budget is exceded when *update length* is ≥ 37 .

Conclusion

To be within exec units budget, *update length* must be 35 or less.

In[283]:=

```
GraphicsRow[{cpuPlot, memPlot}]
```