OpsDev – keeping performance and capacity in focus with development

Steven Thomas
SMT Data

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Session LM

DevOps and OpsDev

Both are a combination of development (Dev) and operations (Ops):

- **DevOps** focuses on making development more agile in deployment of new functionality to production
- **OpsDev** focuses on ensuring that operational considerations (performance, capacity, etc.) are in focus throughout development and deployment


1952 Model 41D
DeLuxe Touring Sedan


Jyllandsringen
JW 56 913
HW 42 791
HW 27 629

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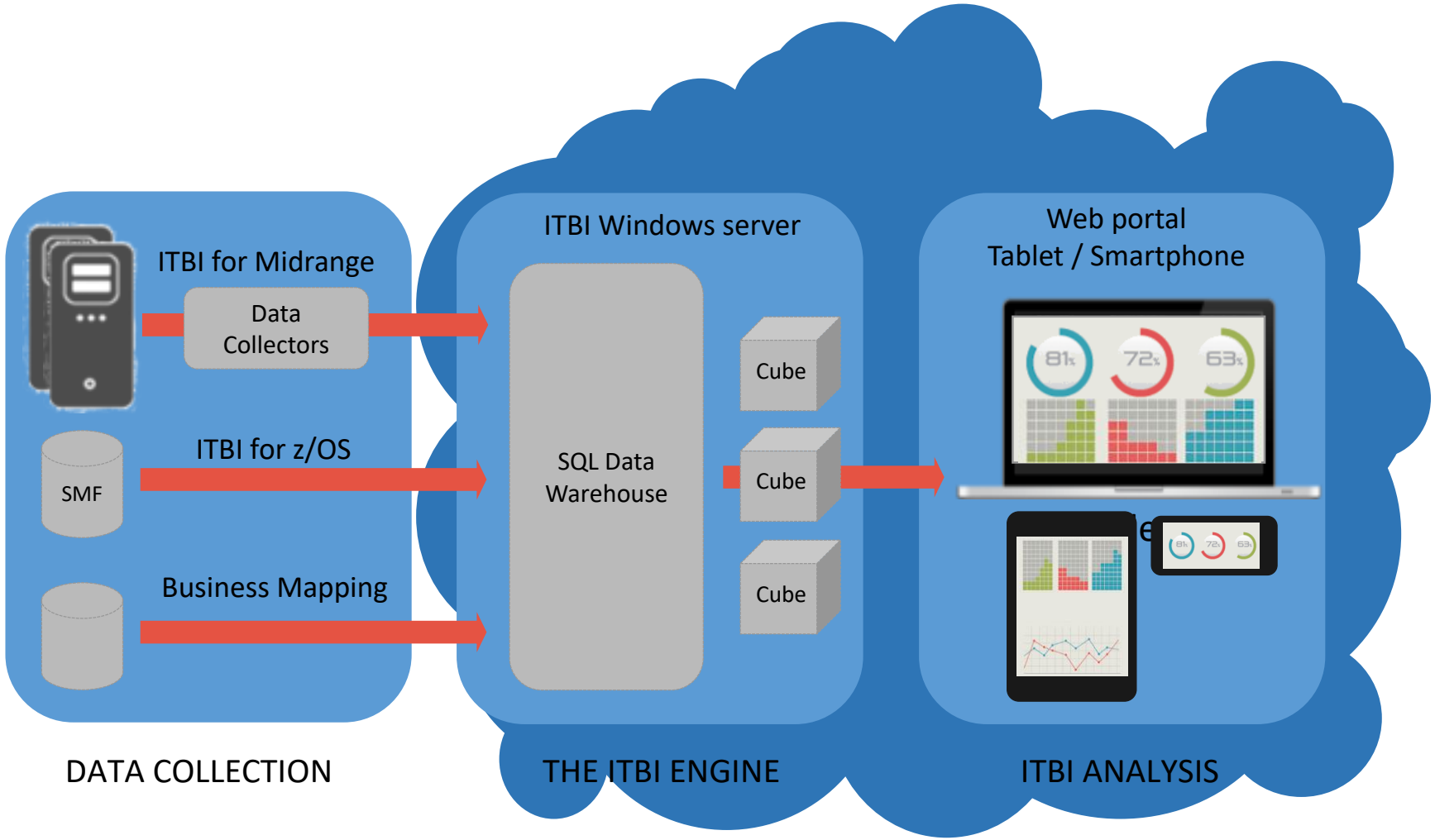
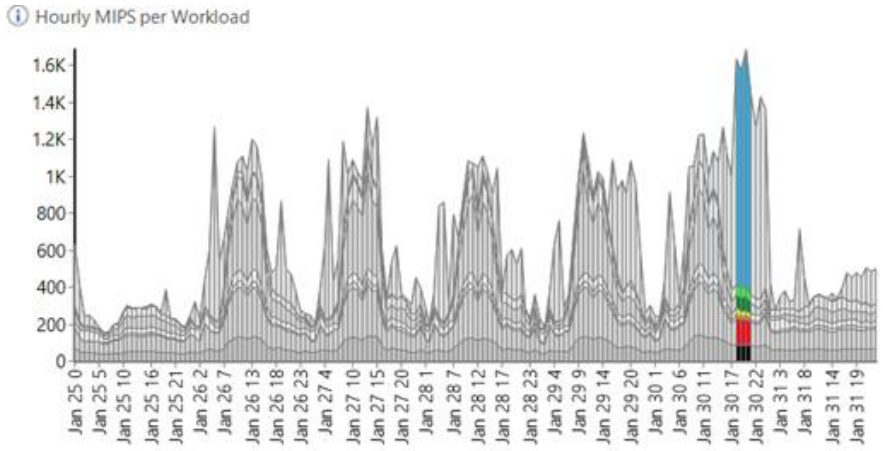
ITBI - Product architecture



OpsDev means measurement and feedback

Ongoing measurement and feedback from the IT-operations teams to the software developers:

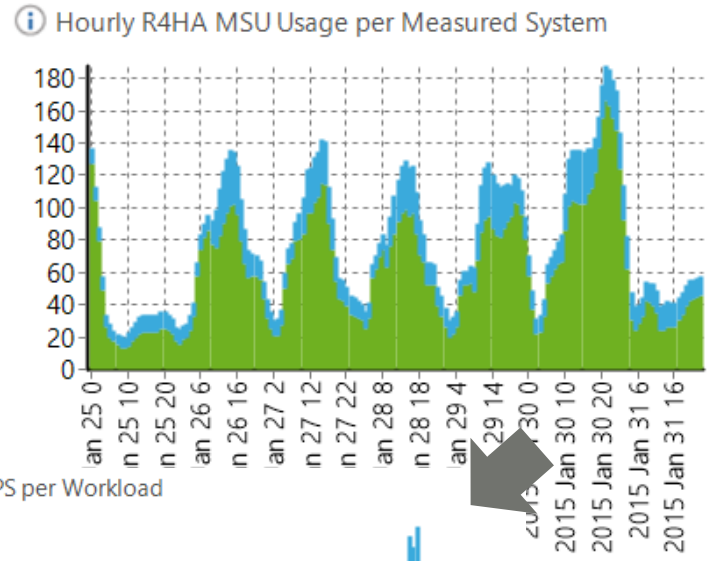
- Identify candidates for tuning and prioritize these efforts alongside functional changes based on the financial impact
- Understand the impact of changes
- Tune and right-size the infrastructure
- Explain the capacity costs in business terms

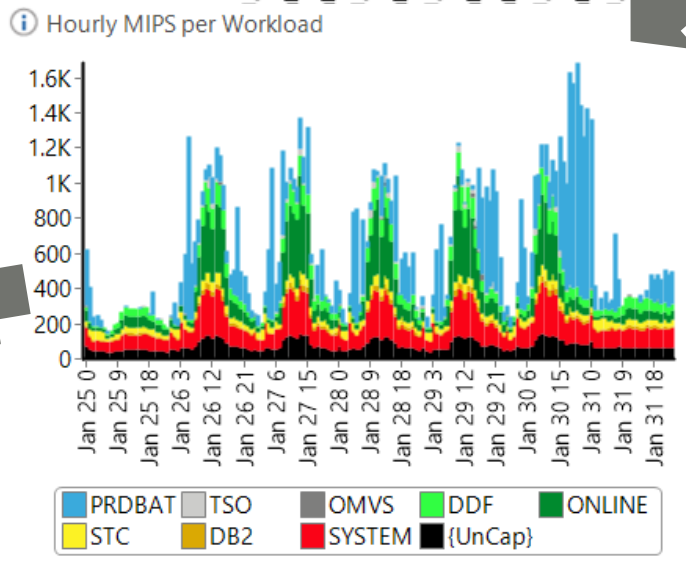


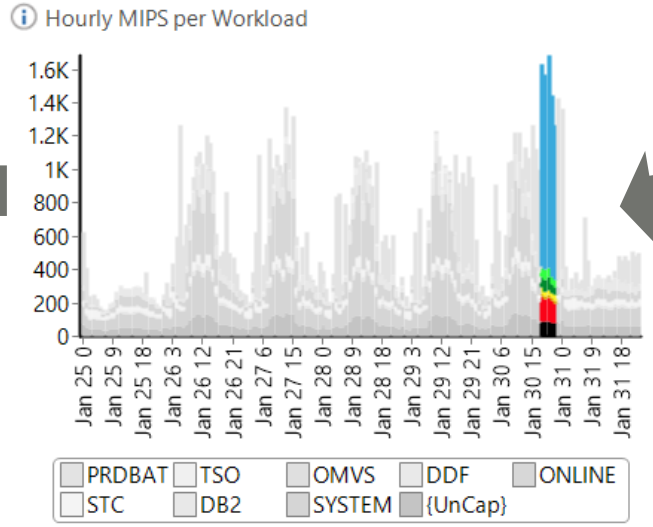
Identify Candidates for Tuning

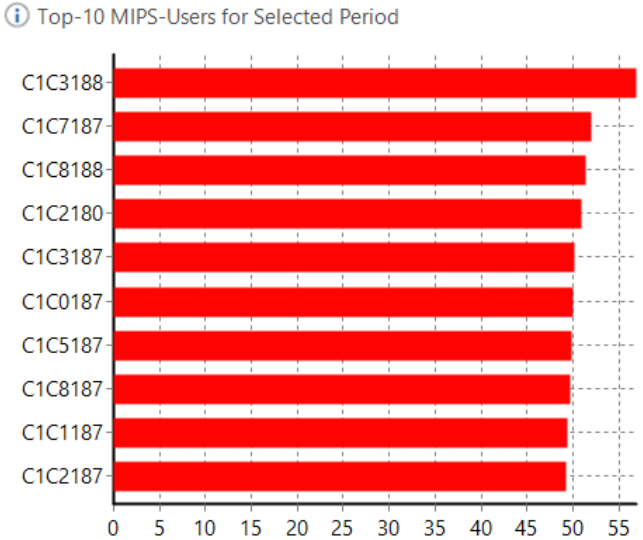
Identify Applications for Tuning - Mainframe

- Identify peaks
- Drill down to understand cost drivers e.g: LPAR, workload, job, transaction, DB2 package, user, etc.

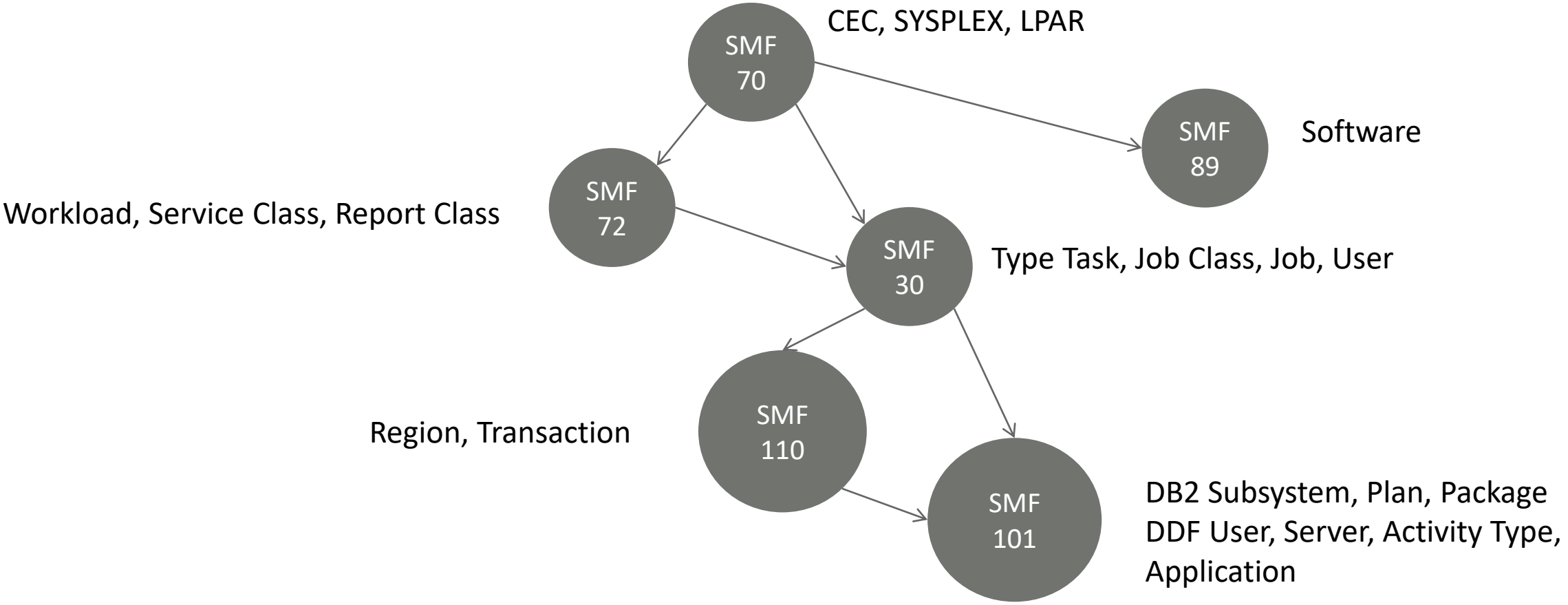




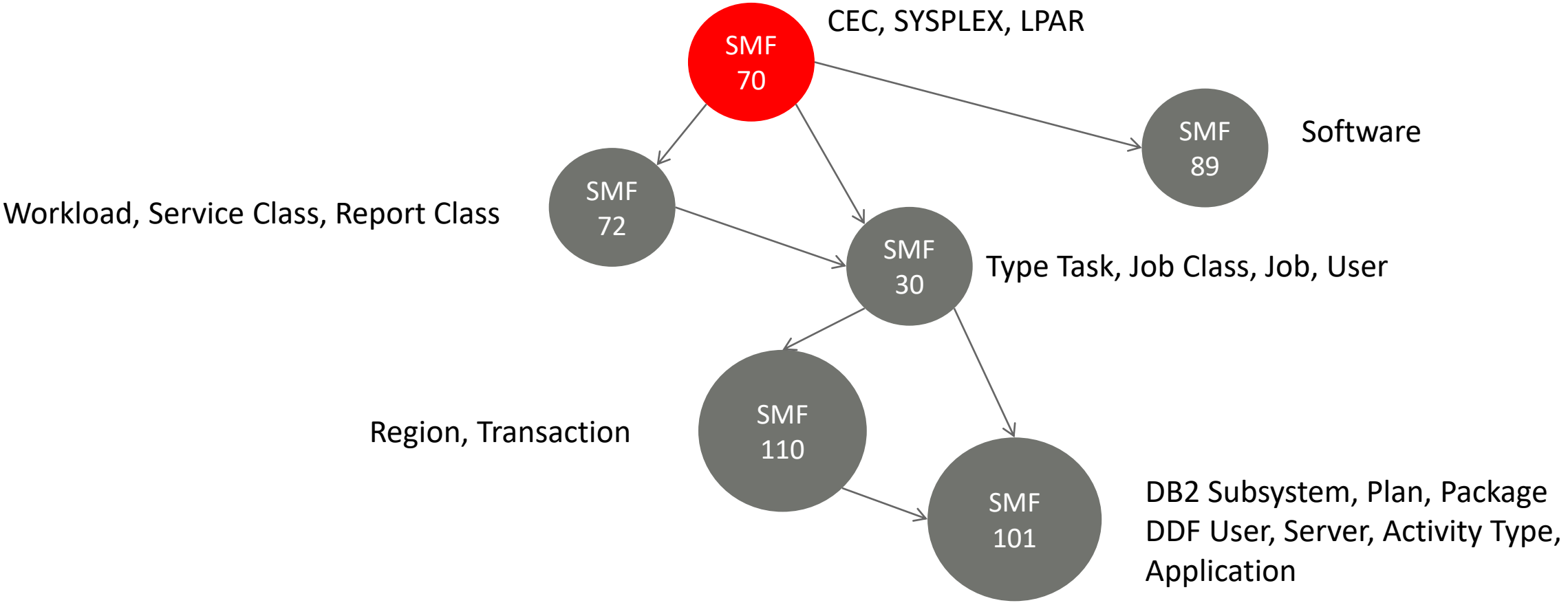




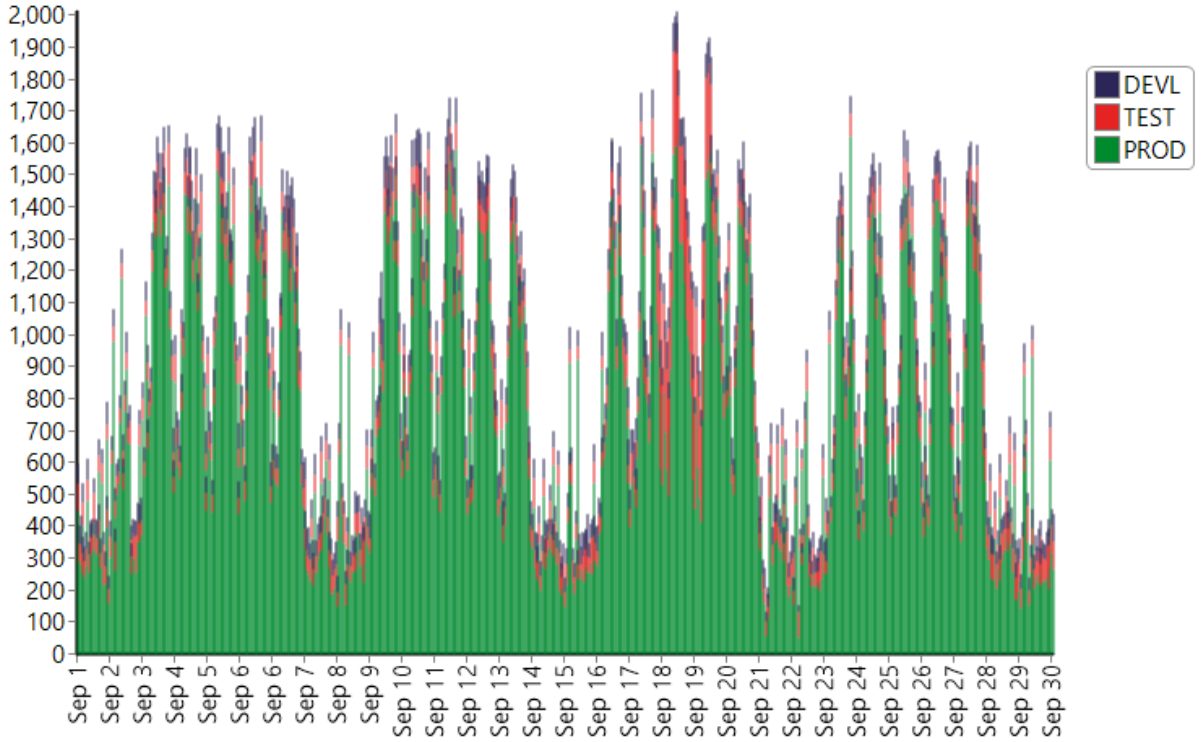
Drilling down to understand peaks

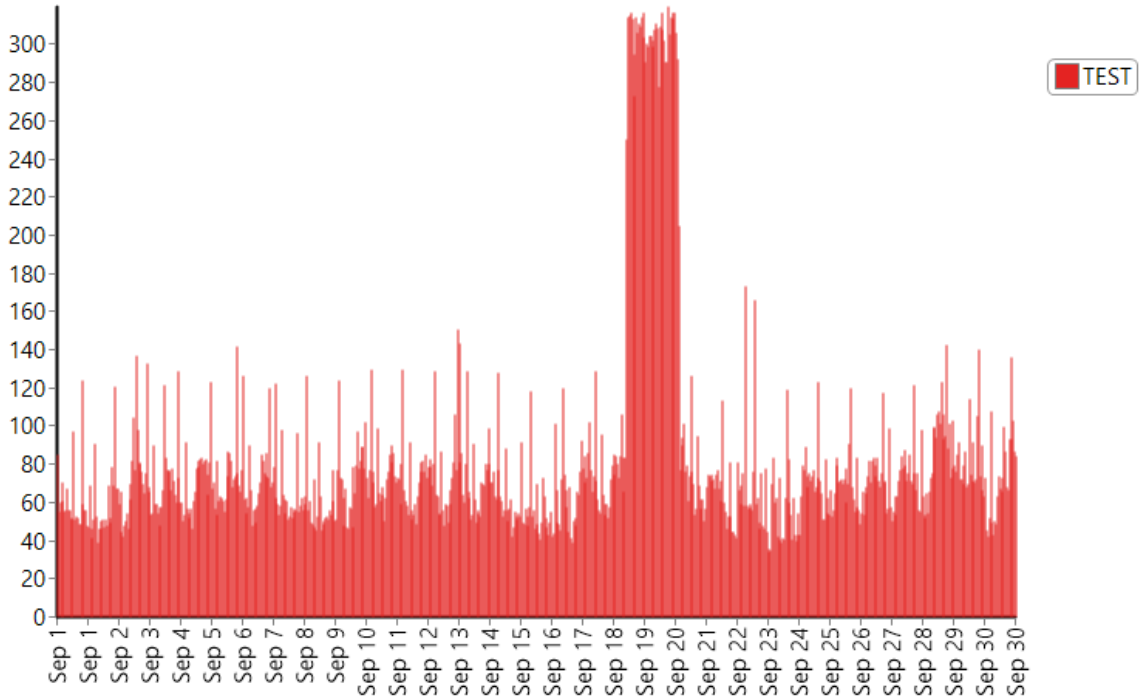


Example: Test LPAR peak during month peak



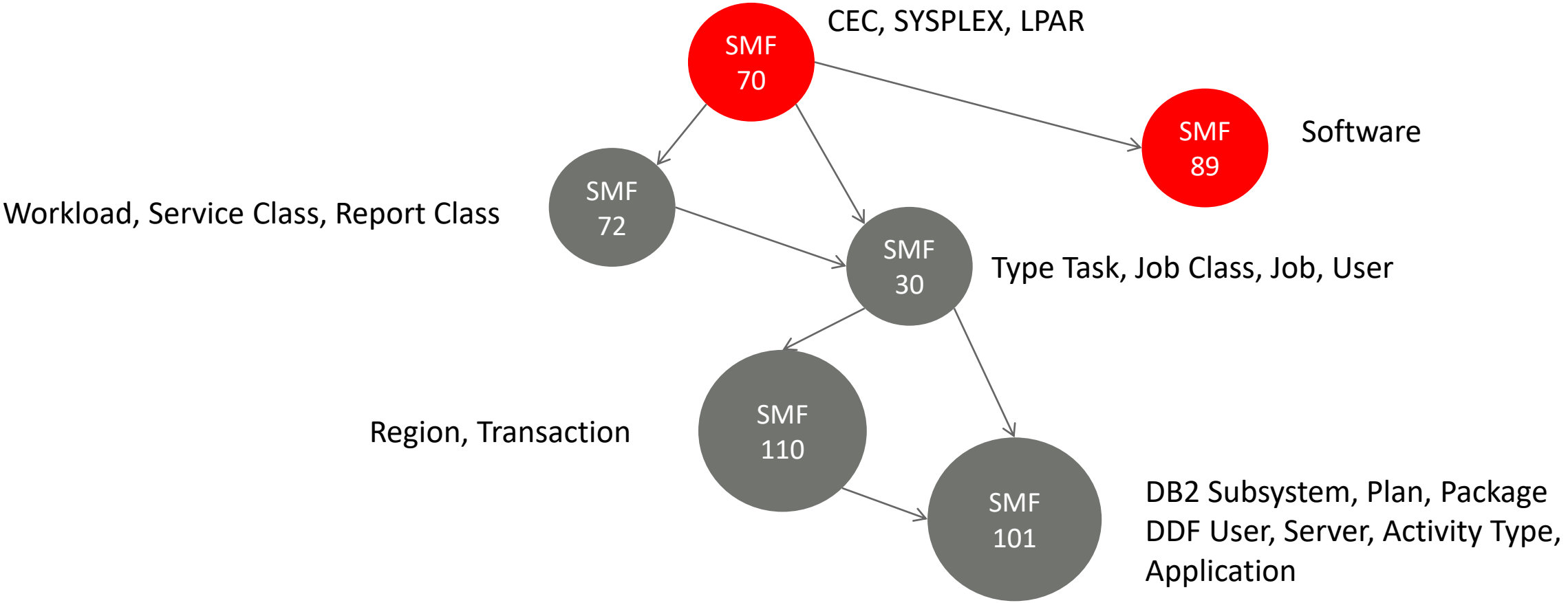
SMF70



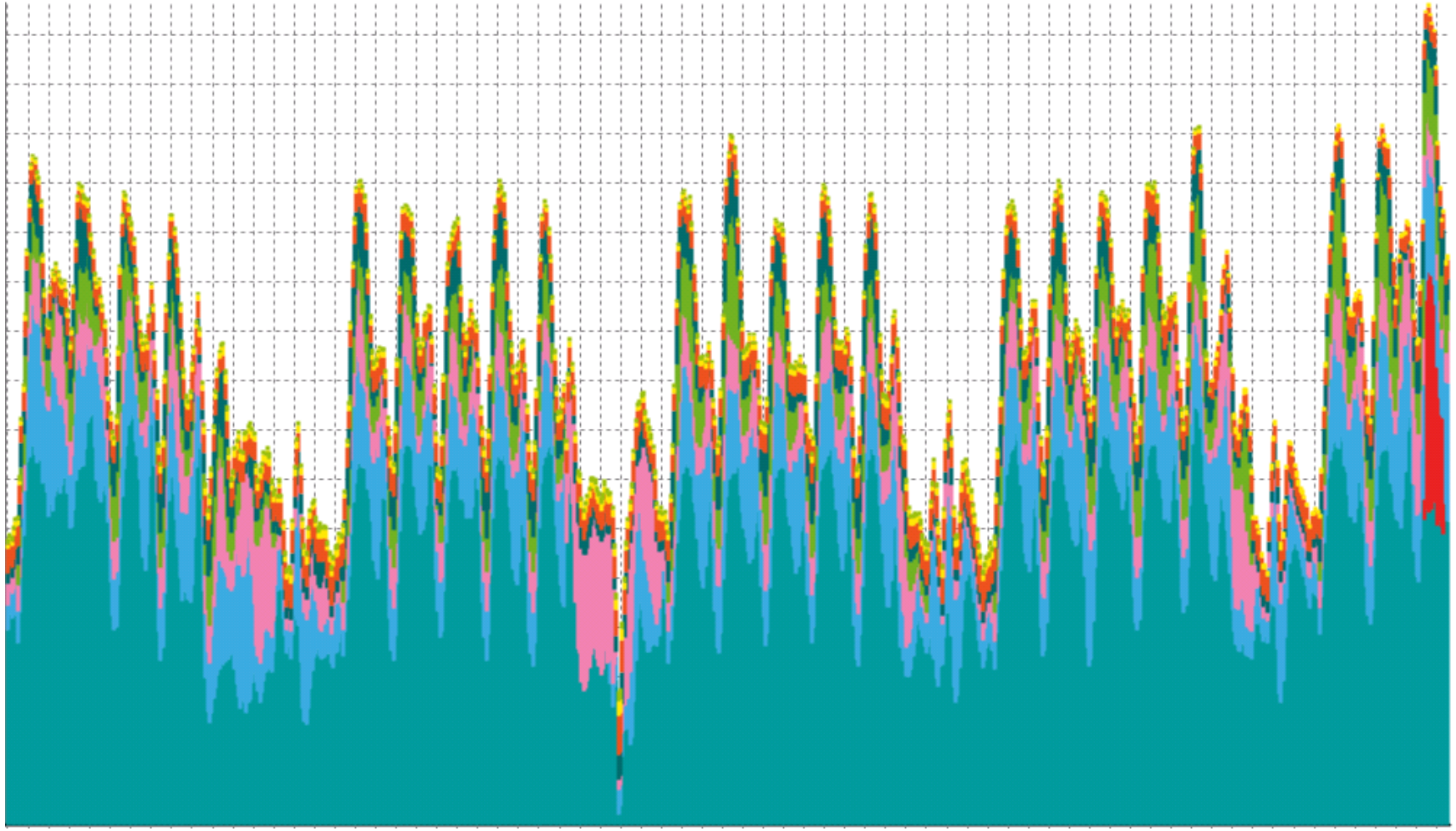


Test LPAR using 300 MIPS during monthly peak online hours.

Example: Test LPAR using software



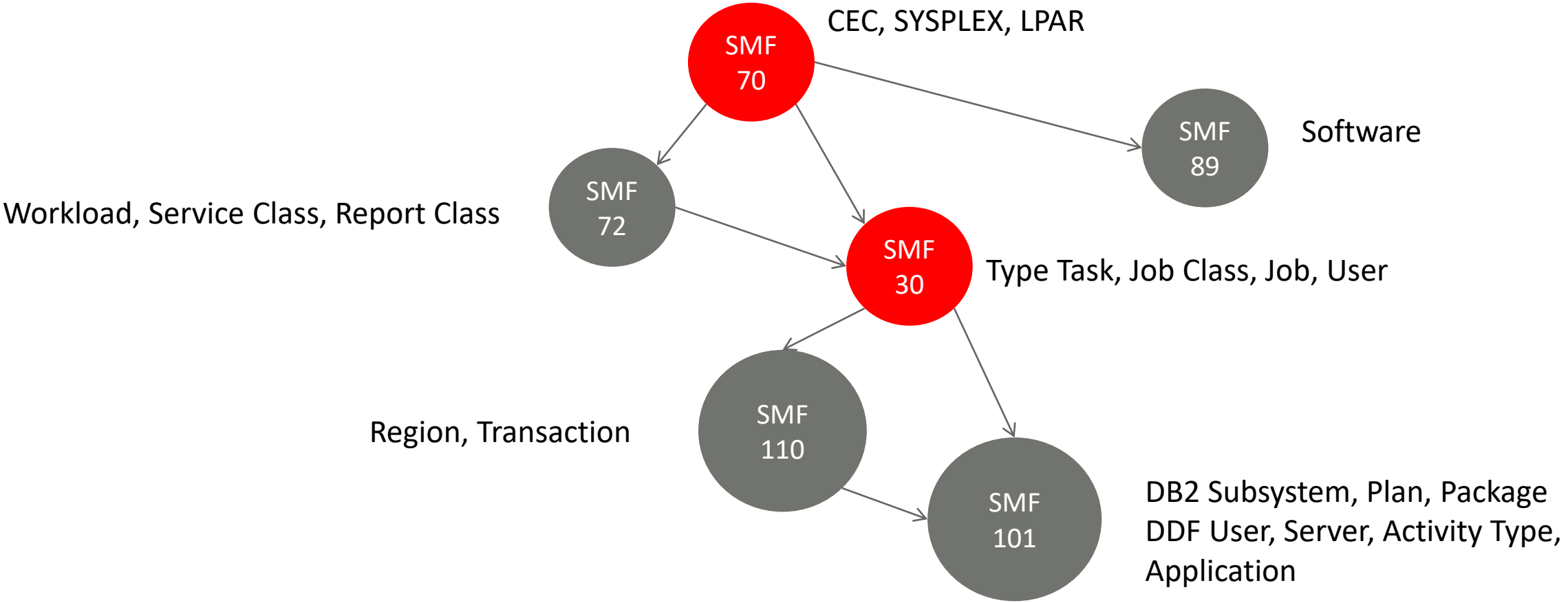
SMF 70 + 89



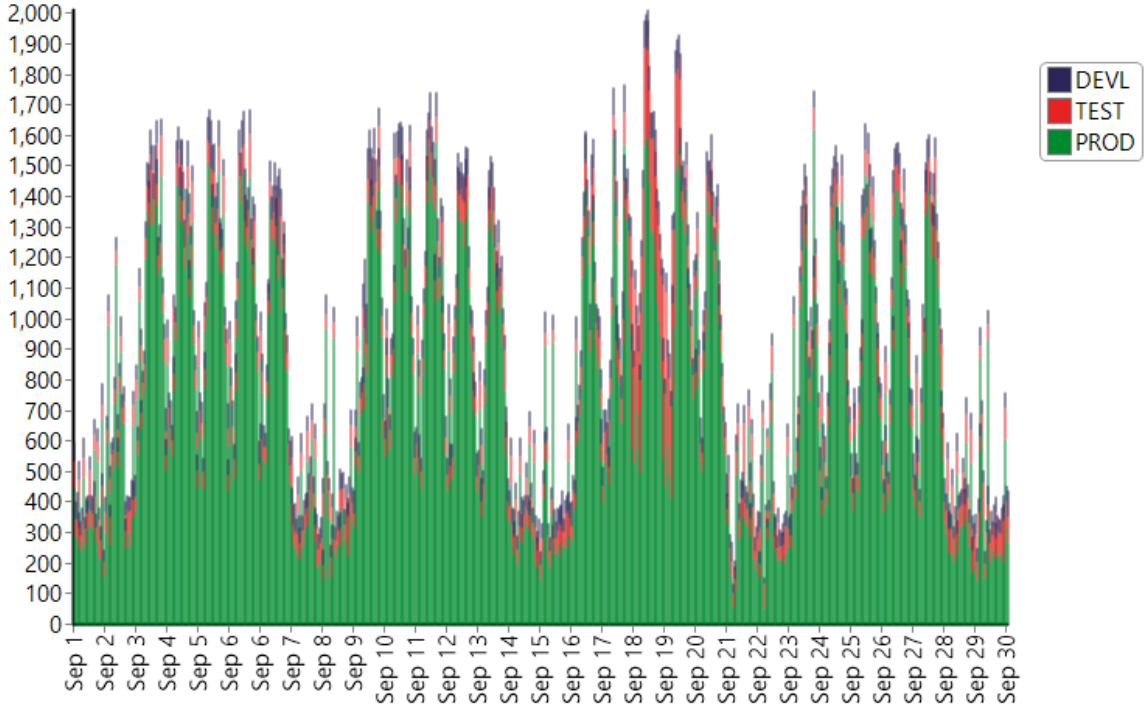
SMF 89 registers which software products are running on which LPARS. This is the basis for the SCRT report and IBM Software invoicing. The monthly charge is determined by the peak 4HRA MSU usage for all the LPARS running a given product.

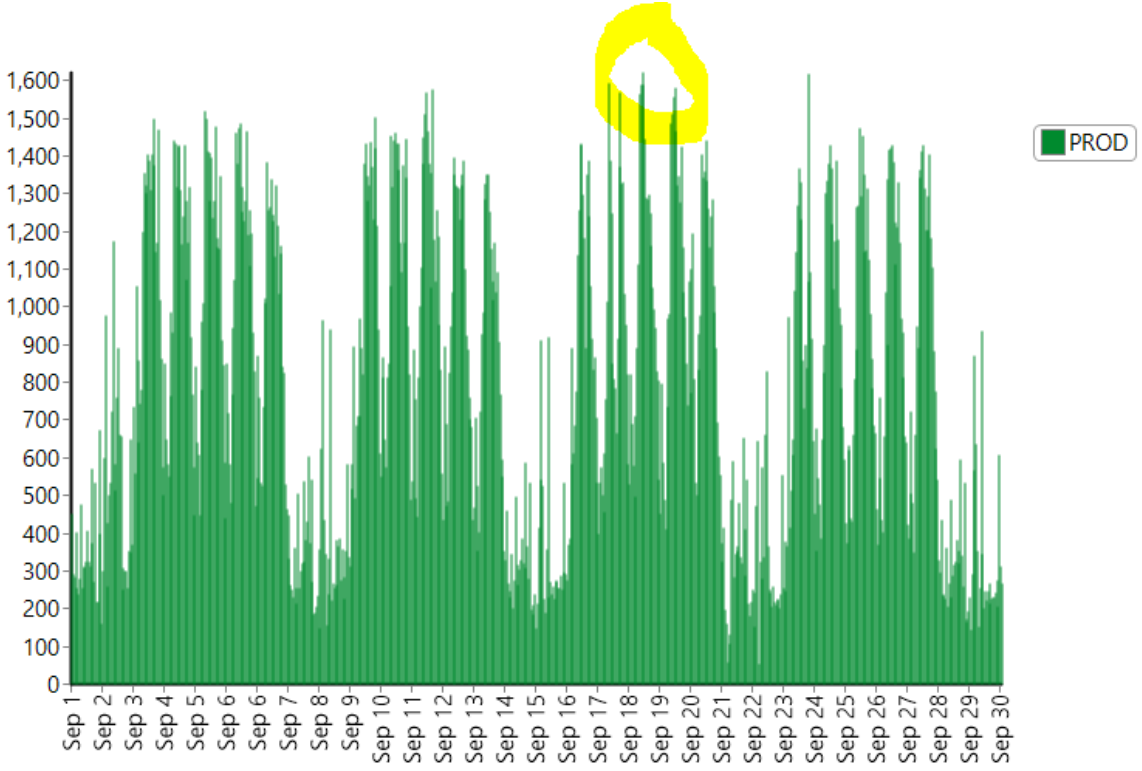
Here we see the impact of a developer starting CICS on a test LPAR (red)

Example: Batch jobs requires tuning



SMF70

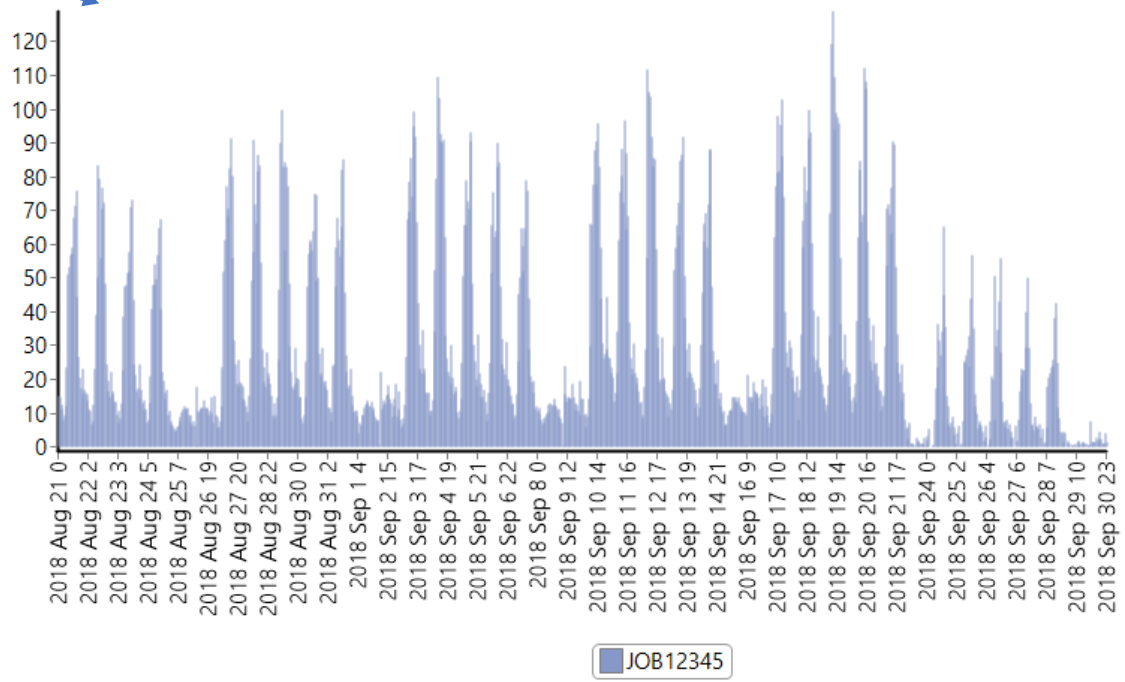




Even without the Dev and Test LPARS, September 19th is still the peak day.

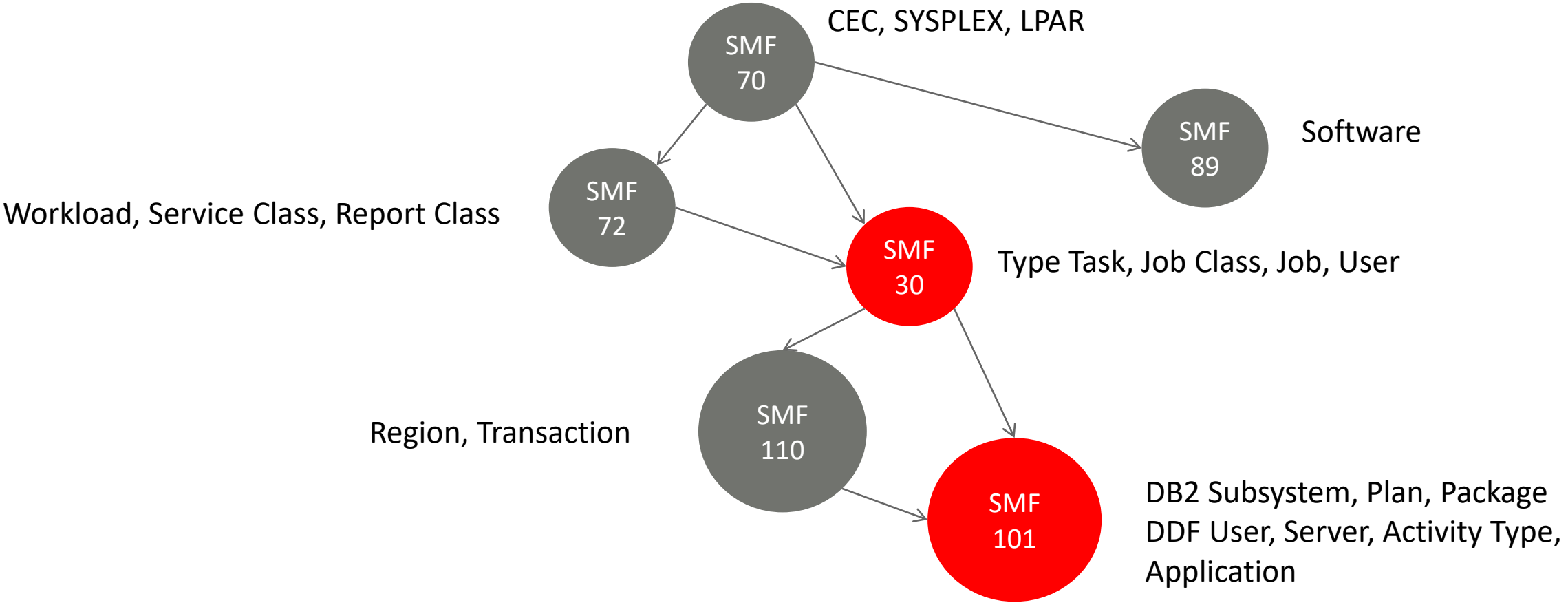
SMF 30

Total	437.9	100
JOB12345	87.7	20
[illegible]	36.7	8
[illegible]	26.4	6
[illegible]	20.5	5
[illegible]	20.3	5
[illegible]	15.3	3
[illegible]	14.4	3
[illegible]	13.0	3
[illegible]	11.0	3
[illegible]	10.8	2
[illegible]	10.5	2
[illegible]	10.2	2
[illegible]	8.6	2
[illegible]	8.5	2
[illegible]	8.1	2

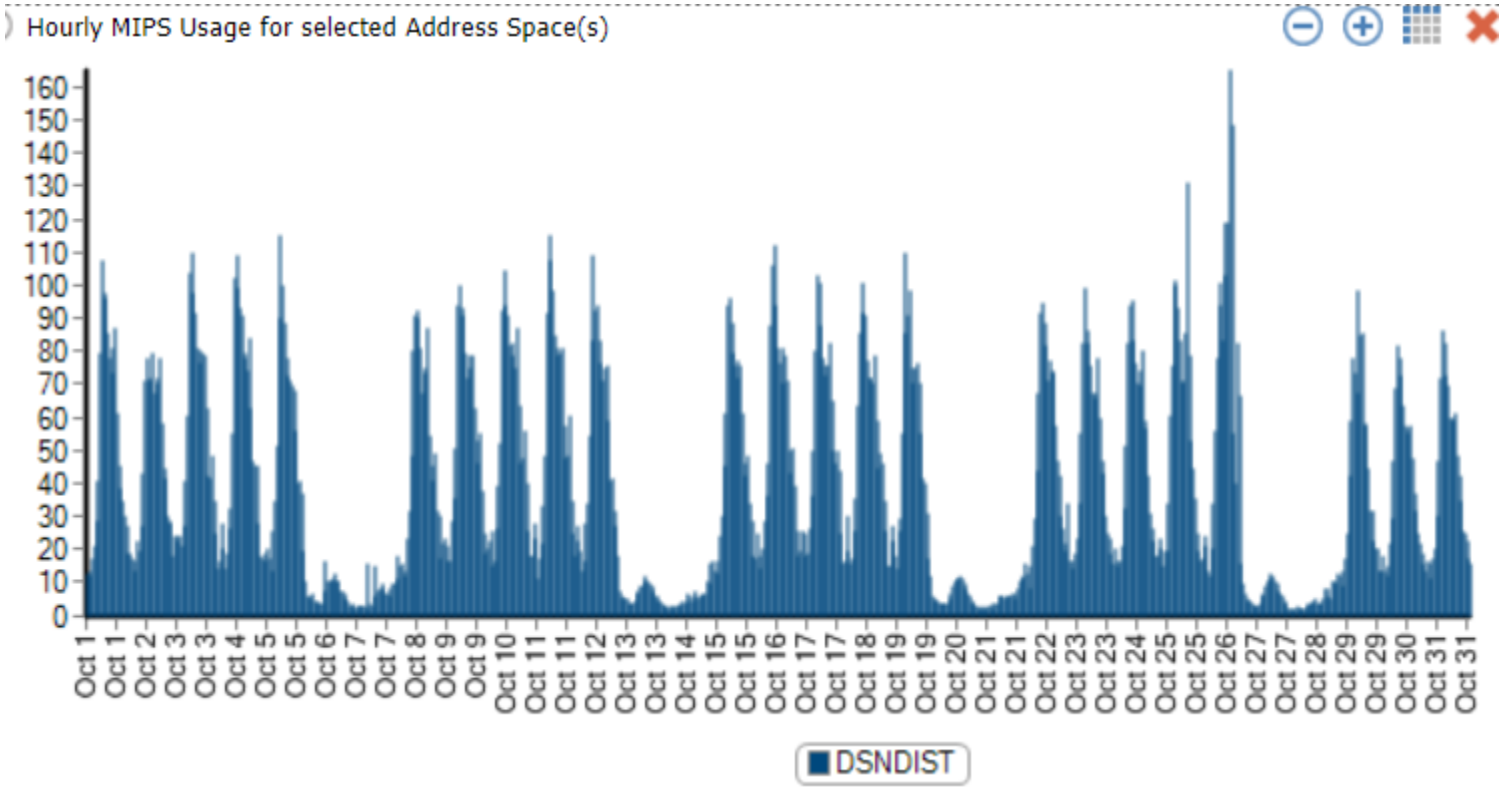


Analysis of SMF30 shows that the MIPS usage of job 'JOB12345' is the top MIPS consuming job and has increased during September due to program changes during the period. A fix is applied Sept 23, that reduces the MIPS consumption

Example: DDF

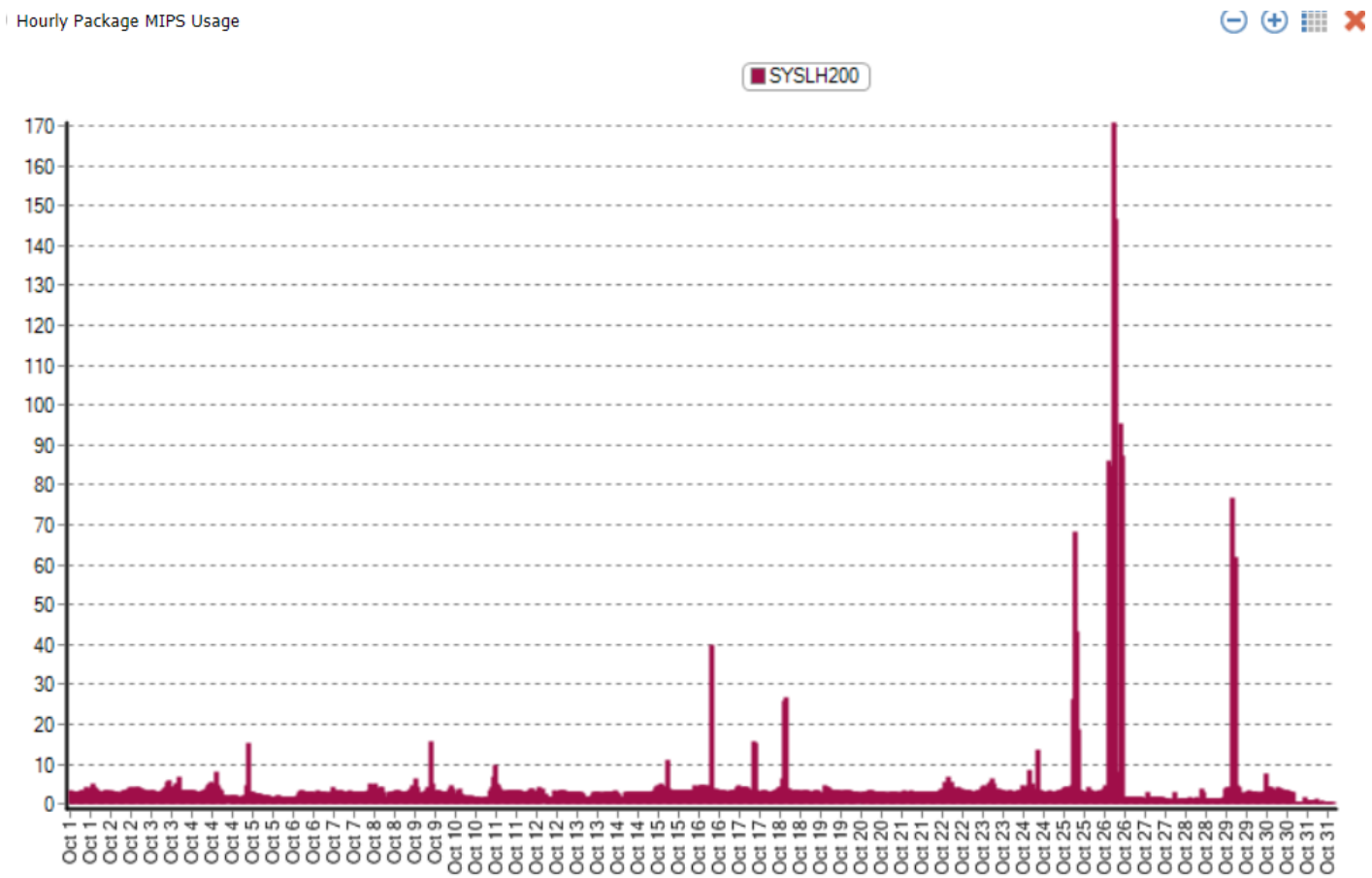

SMF 70
CEC, SYSPLEX, LPAR
SMF 89
Software
SMF 72
Workload, Service Class, Report Class
SMF 30
Type Task, Job Class, Job, User
SMF 110
Region, Transaction
SMF 101
DB2 Subsystem, Plan, Package
DDF User, Server, Activity Type, Application

SMF30



In SMF 30 we can see that DNSDIST (DDF) has a spike on October 26

SMF101



In SMF 101 we see that the spike is primarily due to the SYSLH200 package. As we will see later, we can further classify the workload here based on server, user, application, transaction etc.

Understanding the impact of change

Understand the impact of changes

- Compare two points in time
- Look at trends over time
- Drill down to the details

Growth in Top MIPS-consuming Trx

	—	2015	Growth
	—	Apr	
	23	24	
M0UÆ	15.49	35.43	129 %
M3CJ	19.73	21.83	11 %
M7CØ	7.06	9.02	28 %
M8UQ	4.38	3.27	-25 %
MVTJ	3.78	2.72	-28 %

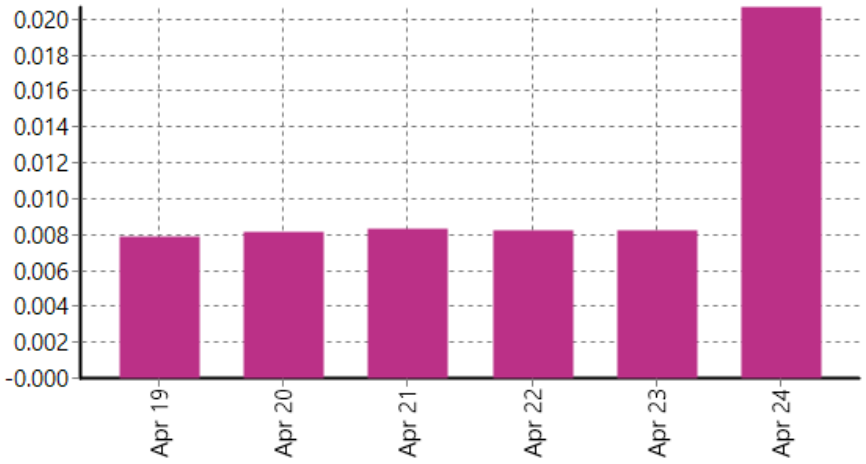
Growth in # Trx

	—	2015	Growth
	— Apr		
	23	24	
M0UÆ	68,490	57,396	-16 %

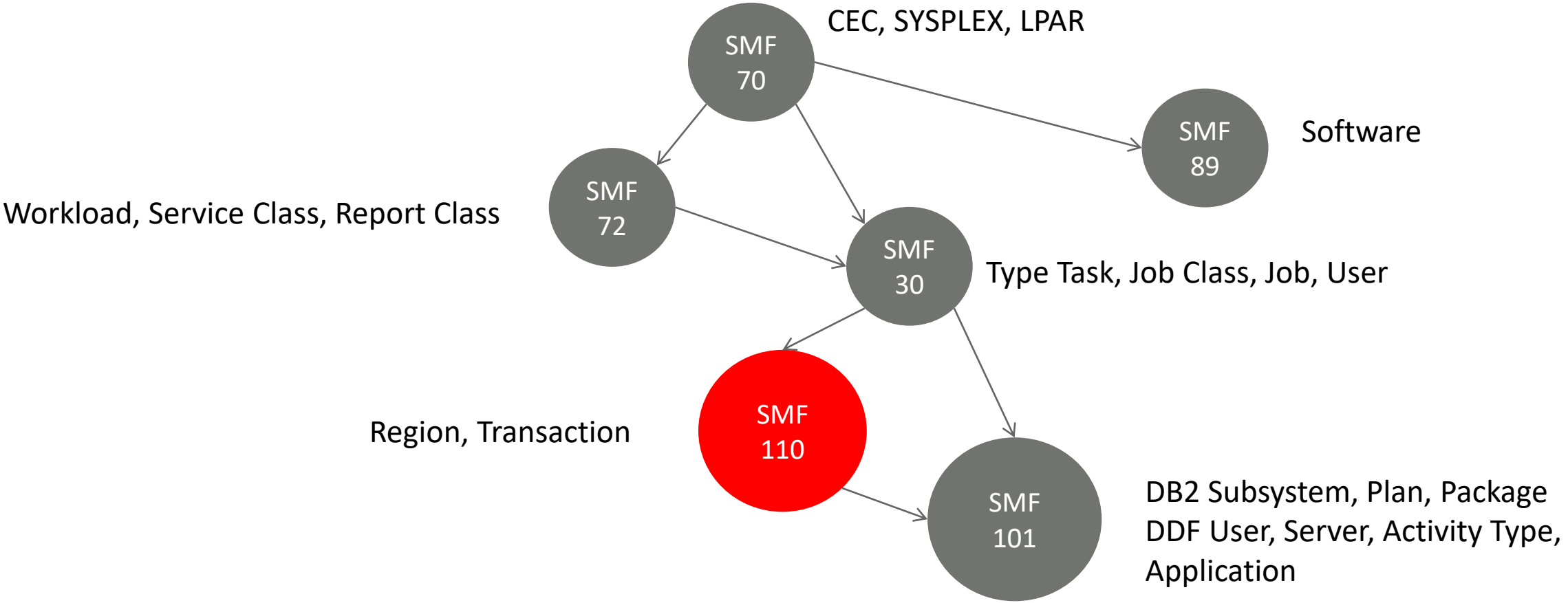
Growth in heaviest Trx (CPUsec / Trx)

	—	2015	Growth
	—	Apr	
	23	24	
M0UÆ	0.008	0.022	173 %

Average CPU-Seconds per selected CICS Transaction(s) over Time



Example: CICS



SMF 110

Growth in Top MIPS-consuming Trx

—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	15.49	35.43	129 %
M3CJ	19.73	21.83	11 %
M7CØ	7.06	9.02	28 %
M8UQ	4.38	3.27	-25 %
MVTJ	3.78	2.72	-28 %
M4CJ	2.89	3.15	9 %
VJ7C	.09	3.00	3,323 %
M2Ø7	.82	.85	3 %
M9UØ	.53	.82	56 %
VTAN	.55	.54	-2 %
M3UJ	.55	.51	-8 %
VH7E	.77	.23	-70 %
VL7E	.51	.40	-21 %

Growth in # Trx

—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	68,490	57,396	-16 %
M3CJ	34,518	36,815	7 %
M4CJ	20,204	21,547	7 %
EZUL	6,183	4,946	-20 %
FYKE	6,183	4,946	-20 %
VL7E	2,594	2,036	-22 %
VI70	2,544	2,005	-21 %
VI7V	2,445	1,919	-22 %
M7CØ	1,745	1,597	-8 %
VG71	1,834	1,499	-18 %
VG7O	1,802	1,479	-18 %
M6CQ	1,578	1,646	4 %
VH7M	1,624	1,318	-19 %

Growth in heaviest Trx (CPUsec / Trx)

—	2015 — Apr 23	2015 — Apr 24	Growth
VJ7C	0.045	2.209	4,860 %
M8UQ	0.520	0.346	-34 %
VR3R	0.338	0.346	2 %
VK7Q	0.328	0.237	-28 %
VH7E	0.254	0.164	-35 %
M3UJ	0.287	0.147	-49 %
MVTJ	0.225	0.166	-26 %
M7CØ	0.147	0.205	40 %
M2Ø7	0.157	0.162	3 %
VK7H	0.120	0.151	26 %
M9UØ	0.100	0.157	57 %
M0UØ	0.109	0.085	-22 %
U282	0.024	0.114	378 %

Growth in Trx Response Time (Seconds)

—	2015 — Apr 23	2015 — Apr 24	Growth
EQQJ	1,887.438	1,887.439	0 %
M3UJ	467.410	262.244	-44 %
M8UQ	113.041	96.748	-14 %
MVTJ	48.334	45.154	-7 %
HIGU	44.685	45.158	1 %
M6UJ	37.945	35.984	-5 %
M5UQ	36.615	33.343	-9 %
MVKJ	34.361	33.258	-3 %
U284	34.191	32.132	-6 %
U286	42.226	30.022	-29 %
M7UJ	31.799	31.429	-1 %
M9UØ	30.839	31.761	3 %
MXTJ	30.977	30.384	-2 %

Using the SMF 110 we can compare two points in time. Here we see change in terms of total MIPS, number of transactions, MIPS per transaction, and response time.

SMF 110

Growth in Top MIPS-consuming Trx

—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	15.49	35.43	129 %
M3CJ	19.73	21.83	11 %
M7CØ	7.06	9.02	28 %
M8UQ	4.38	3.27	-25 %
MVTJ	3.78	2.72	-28 %
M4CJ	2.89	3.15	9 %
VJ7C	.09	3.00	3,323 %

Growth in # Trx

—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	68,490	57,396	-16 %

Growth in heaviest Trx (CPUsec / Trx)

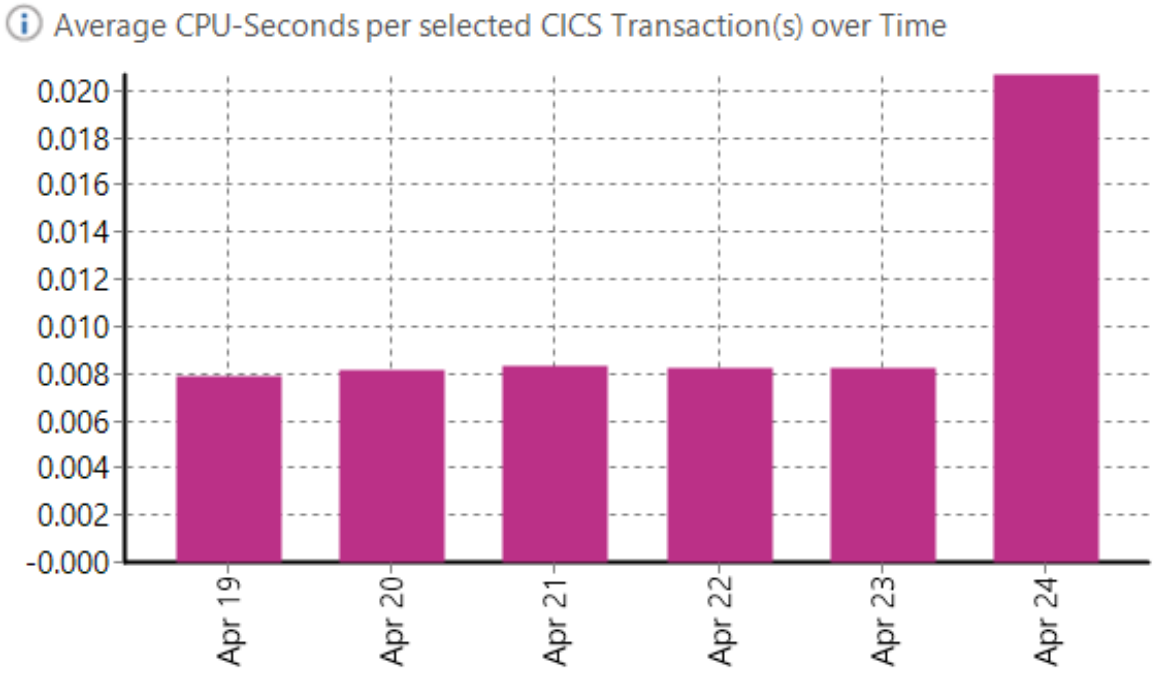
—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	0.008	0.022	173 %

Growth in Trx Response Time (Seconds)

—	2015 — Apr 23	2015 — Apr 24	Growth
M0UÆ	0.121	0.137	13 %

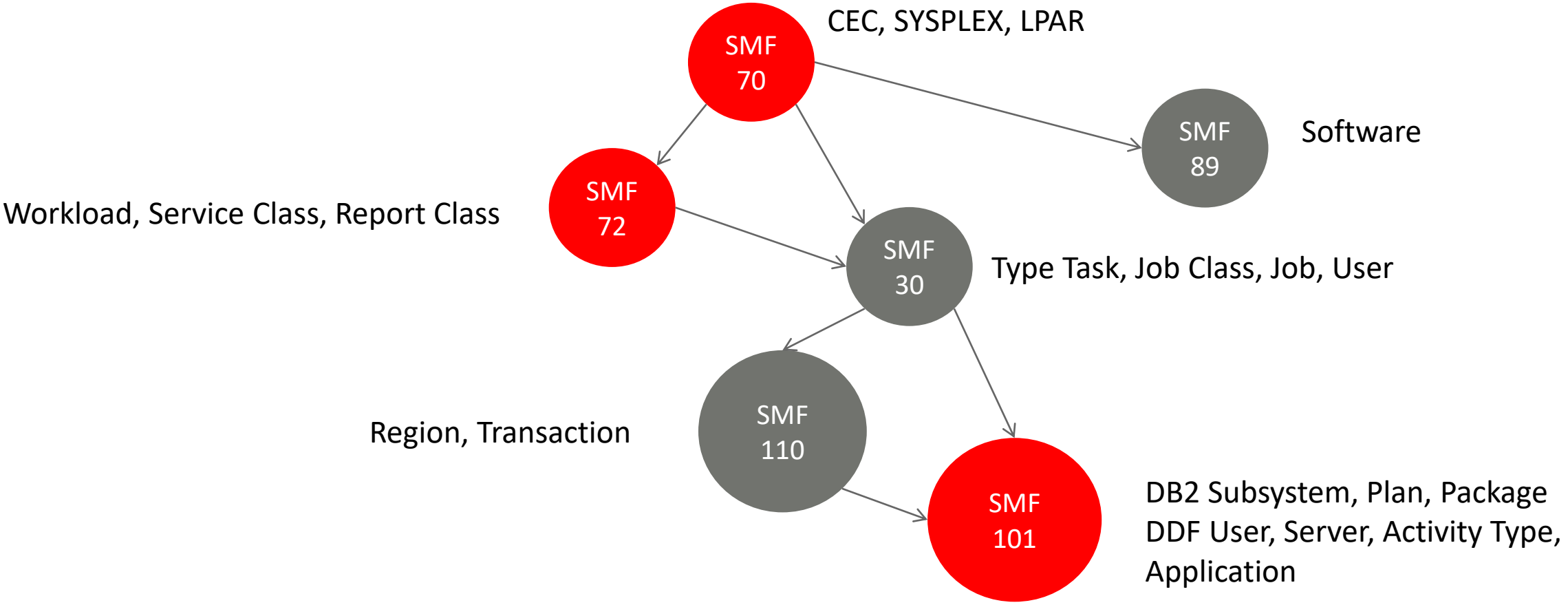
Selecting the MOUÆ transaction, we see that the MIPS increase is not due to increased transaction volumes, but rather due to a significant increase in the MIPS cost per transaction. Note that the response time was not significantly affected by this.

SMF 110

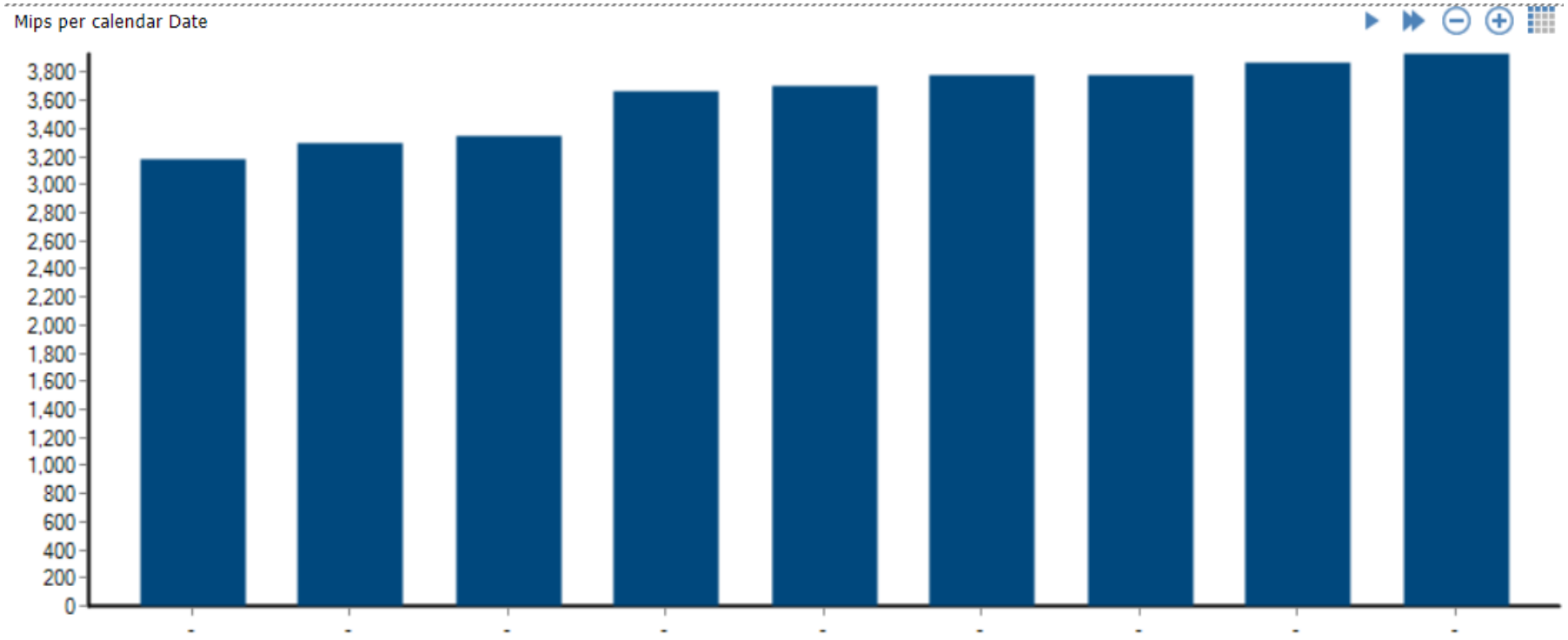


Looking at the MIPS per transaction for this transaction we see a significant change between April 23 and 24, probably indicating an application change.

Example: DDF

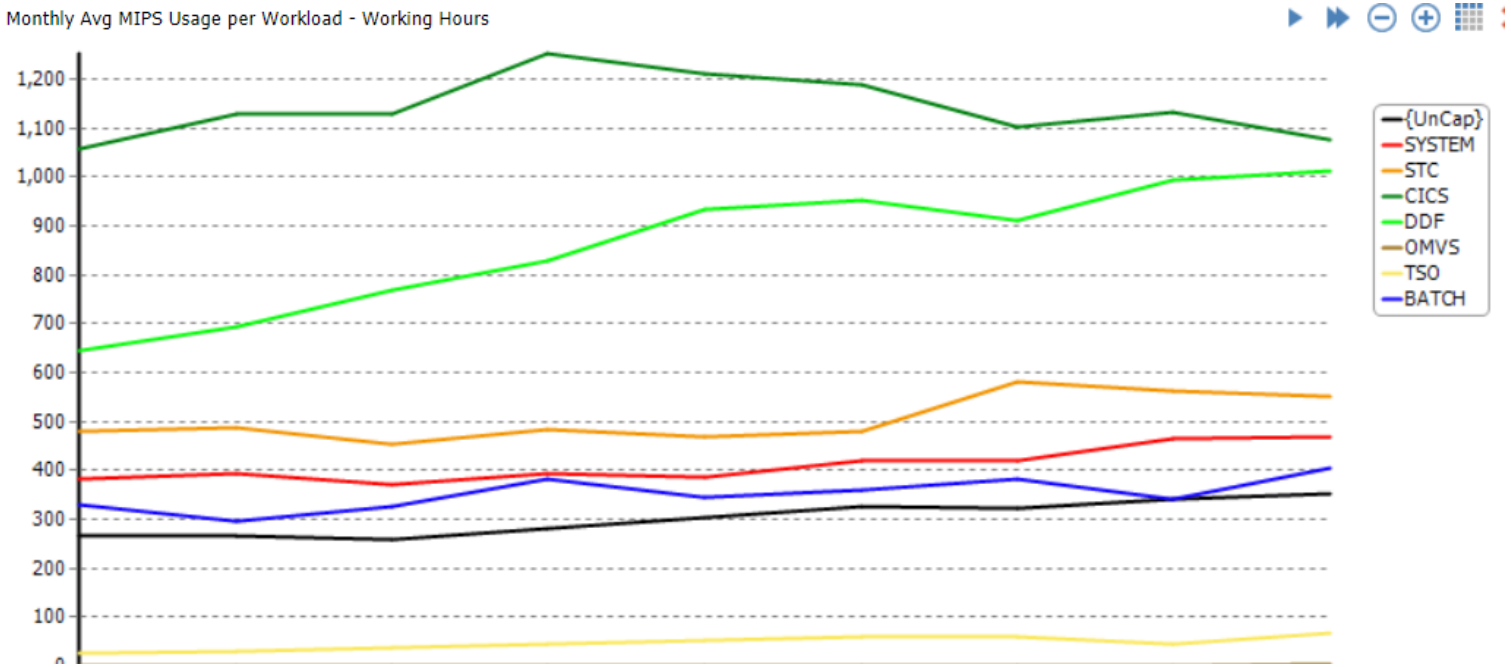

SMF 70
CEC, SYSPLEX, LPAR
SMF 89
Software
SMF 72
Workload, Service Class, Report Class
SMF 30
Type Task, Job Class, Job, User
SMF 110
Region, Transaction
SMF 101
DB2 Subsystem, Plan, Package
DDF User, Server, Activity Type, Application

SMF 70



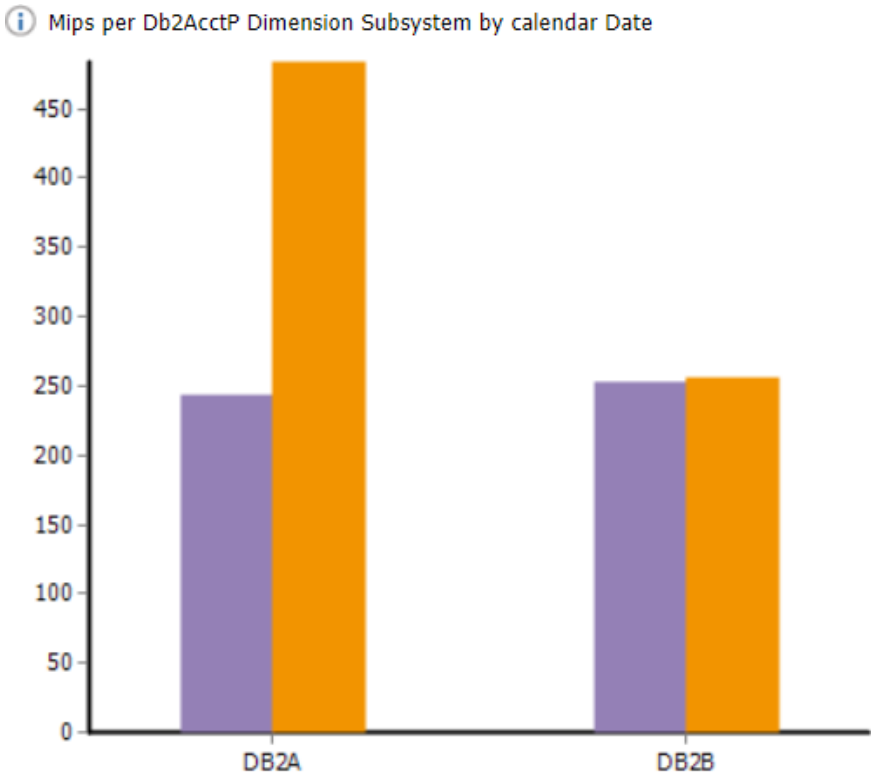
Analysis of SMF70 shows that the average MIPS usage during working-hours increasing month by month

SMF 72



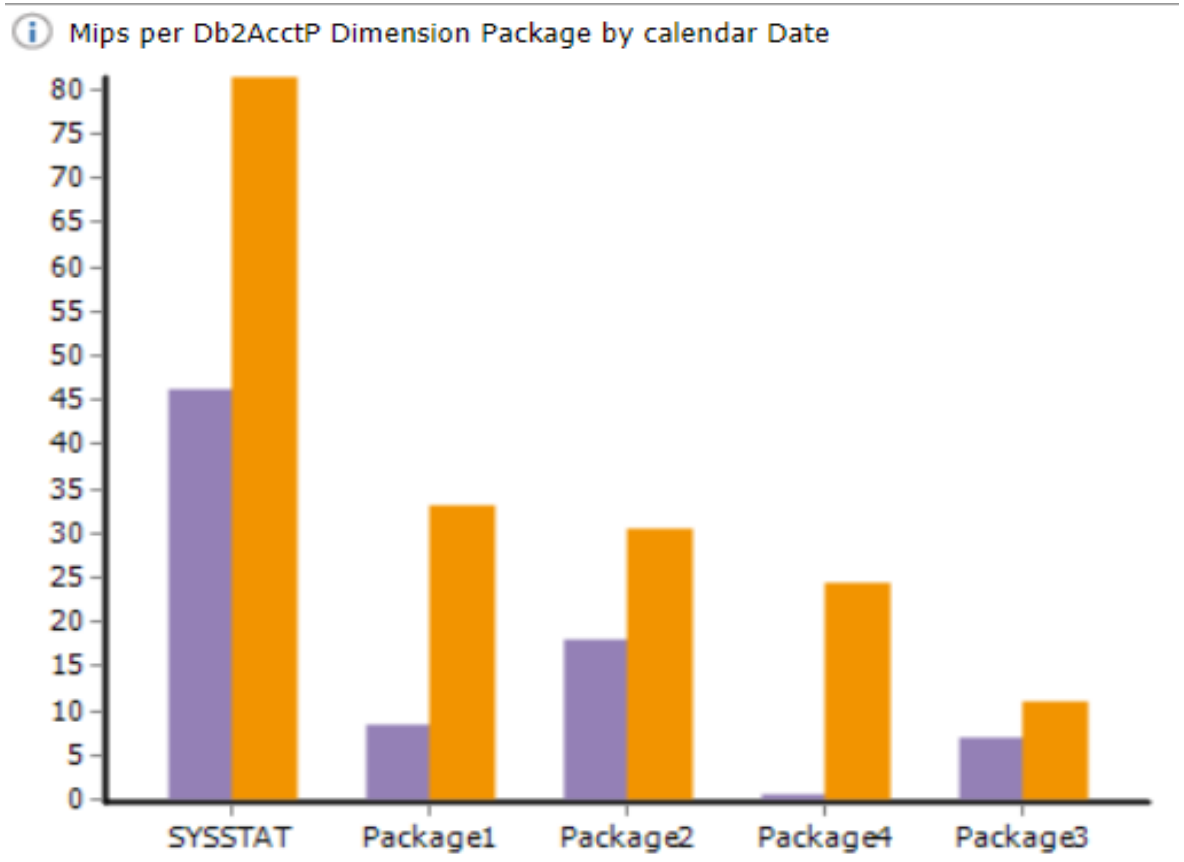
From SMF72 the primary cause of this increase is seen to be the DDF Workload that has increased from 640 to over 1000 MIPS during the 9 month period.

SMF 101



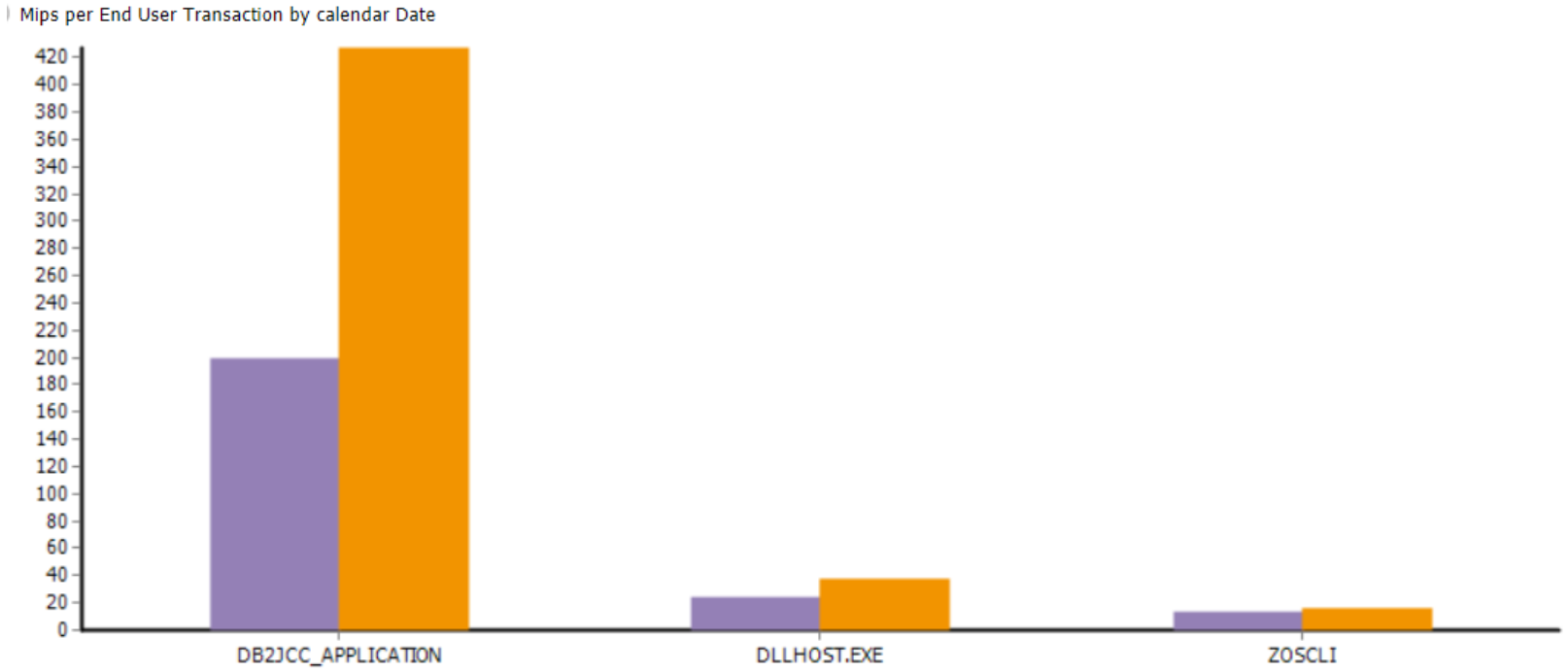
SMF 101 allows us to analyse the change during the period from a number of angles. Here by subsystem where we see that the change is isolated to the DB2A subsystem

SMF 101



Drilling down into the DB2A subsystem by package, we see that SYSTAT (stored procedures) accounts for the largest absolute increase, but package1 and especially package4 have large percentage increase - indicating a probable application change

SMF 101



Further analysis by End User Transaction gives additional insight. Note in this example we only see ‘standard’ transactions such as the IBM Data Server Driver for JDBC and SQLJ. Note that the application developers have the ability to overwrite this with other information using the **setClientProgramName** method.

SMF 101

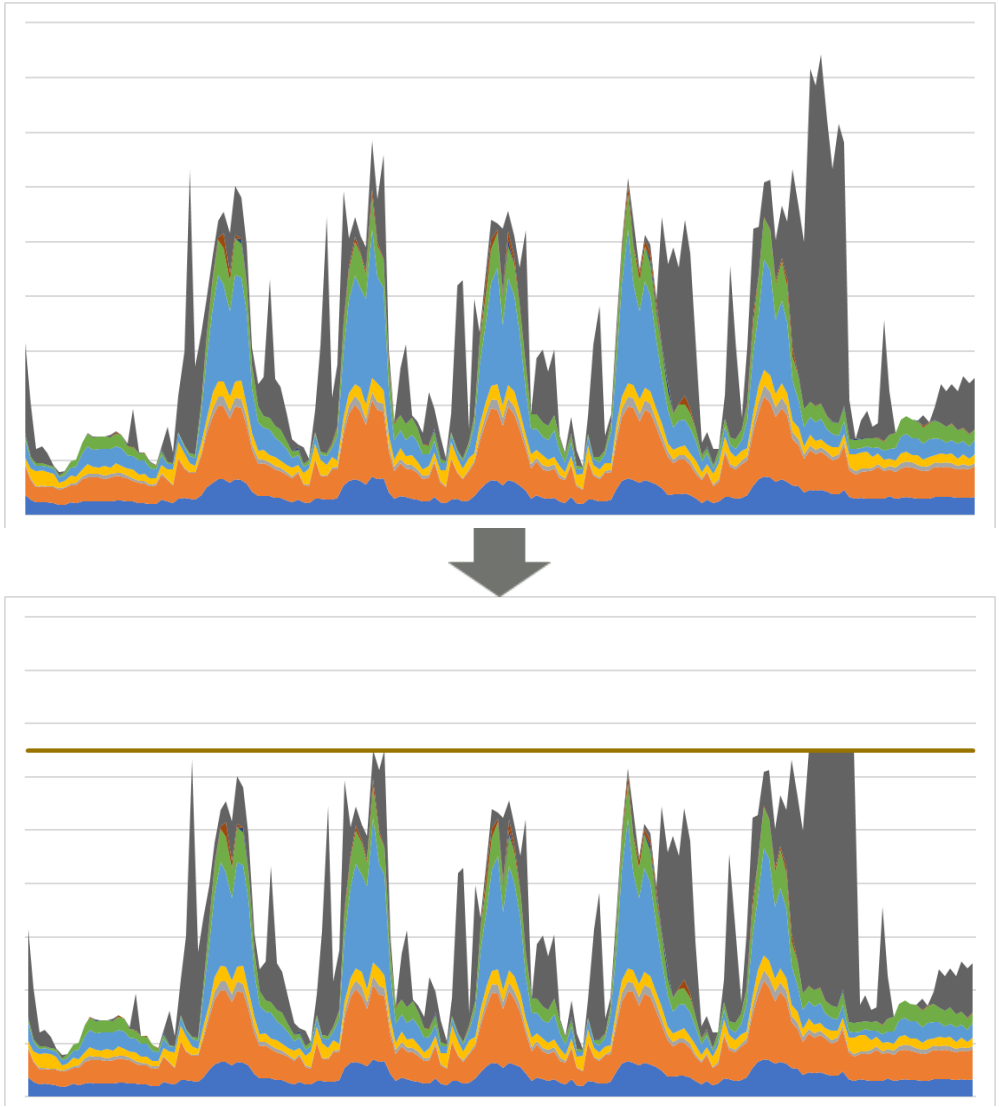
Other areas of interest in the SMF 101 regarding DDF include:

- Server (ip address)
  - Mapping server ip addresses to business areas or applications can be useful
  - But note this may be a gateway server and may not say much about where the workload is coming from
- Userid or Authorization id
  - But note that the application may be running under a standard ‘production’ user
  - Running different applications under different ‘production’ userids can be an easy way to further split out the workload coming from DDF
  - Mapping userids to business areas or applications can also be useful here

Tune the infrastructure

Tune Infrastructure

- Understand what is contributing to peak utilization
- Tune system parameters to reduce consumption during peak
- Move things away from the peak:
  - Manual capping
  - Automatic (dynamic) capping
  - Rescheduling

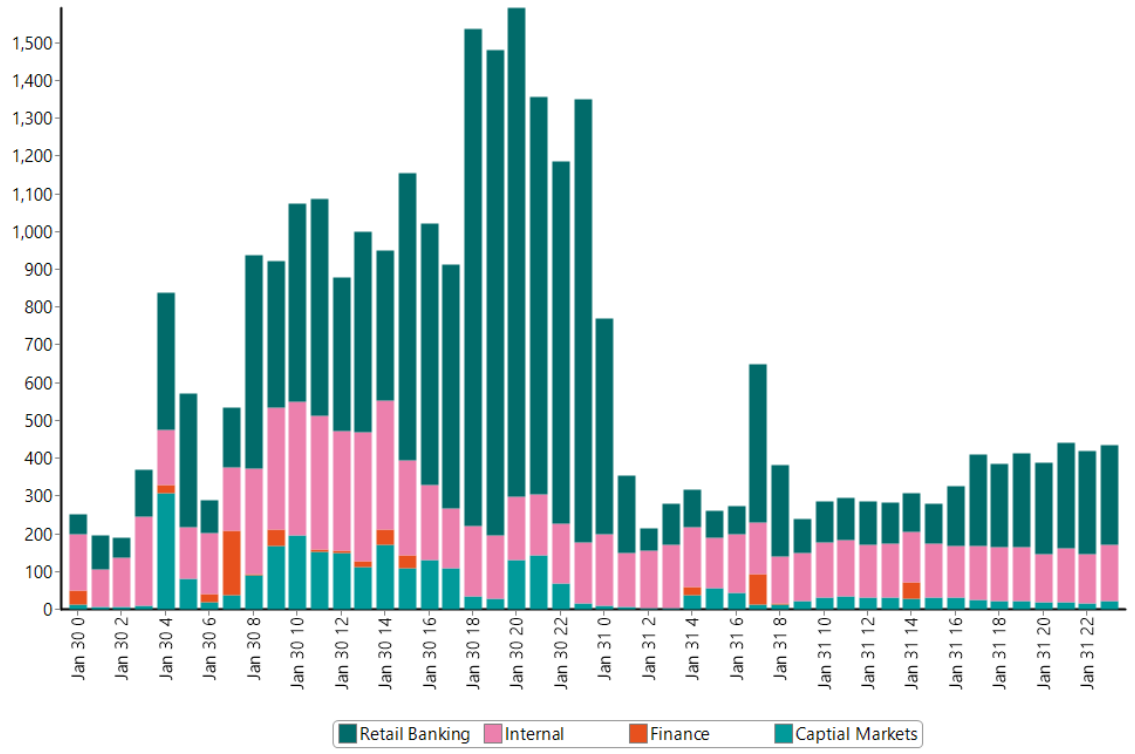


Explain the costs to the business

Explain the capacity costs to the business

- Map the technical measurements to something the business or developers can understand:
  - Application
  - Organization
  - Environment
  - Service Provider

- Translate the technical measurements such as MIPS or MSU into money



Conclusions

- SMF and other capacity data can form the basis of a fruitful dialog with development
- Making the data available in terms that are understandable to the developers helps
- Developers can help make the data more useful through business mapping and by putting additional information into the SMF
- Making self service reporting available to the developers helps
- Internal charge back or show back can be built on this data to increase the level of attention and motivation from development

We want your feedback!

- Please submit your feedback online at ….
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