Mainframe IT Operational Analytics in BPCE-IT Examples

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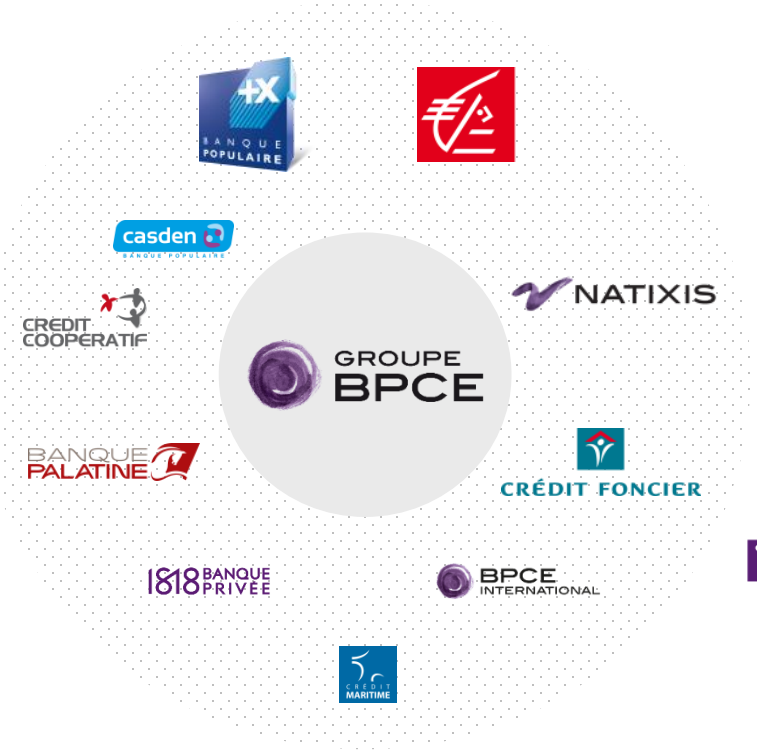
Who is BPCE ?



Second Bank Group in France

9 millions corporate members

31,2 millions customers

108 000 contributors

8 000 banking agencies

Présent in **48** countries

20 % of french economy financing

BPCE-IT Mainframe Technical Environment

Topaze

S1

z14 737

43.338 MIPS LSPR – **5.081** MSU

S3

z14 401

256 MIPS LSPR – 32 MSU

Saphir

S2

z14 736

42.340 MIPS LSPR - **4.963** MSU

S4

z14 401

256 MIPS LSPR - 32 MSU

Examples of some TDSz application in BPCE-IT Mainframe IT Operationnal Analytics

- Statistical Exception Detection
- CICS Monitoring
- CICS Predictive Analysis
- Capacity Planning z
- SCRT Peak Analysis
- …

Statistical Exception Detection

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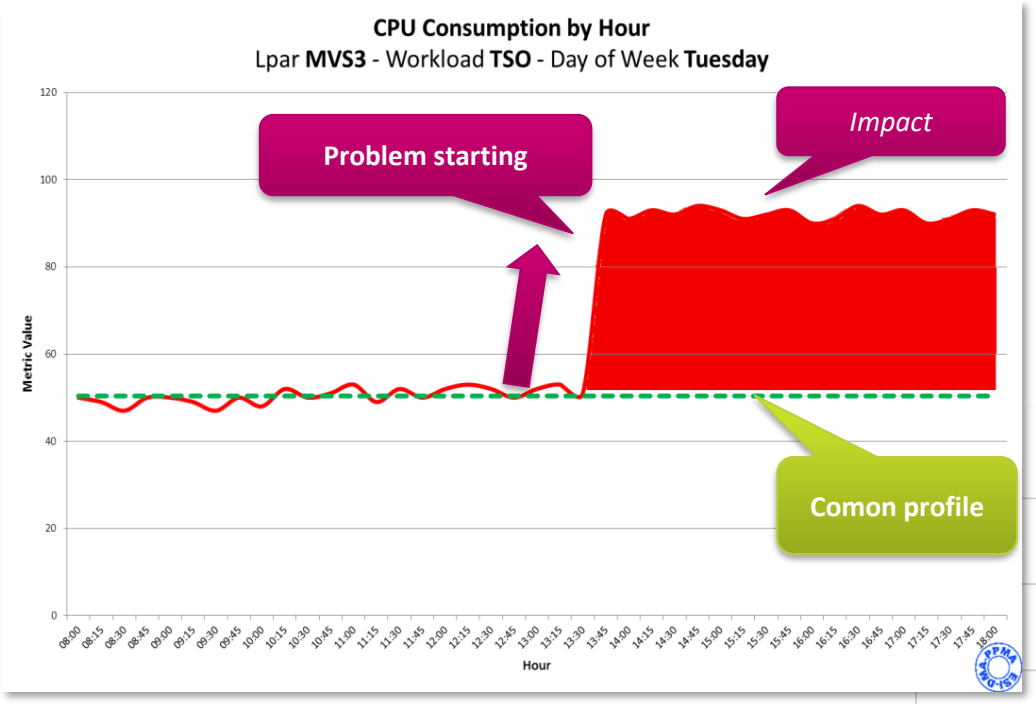
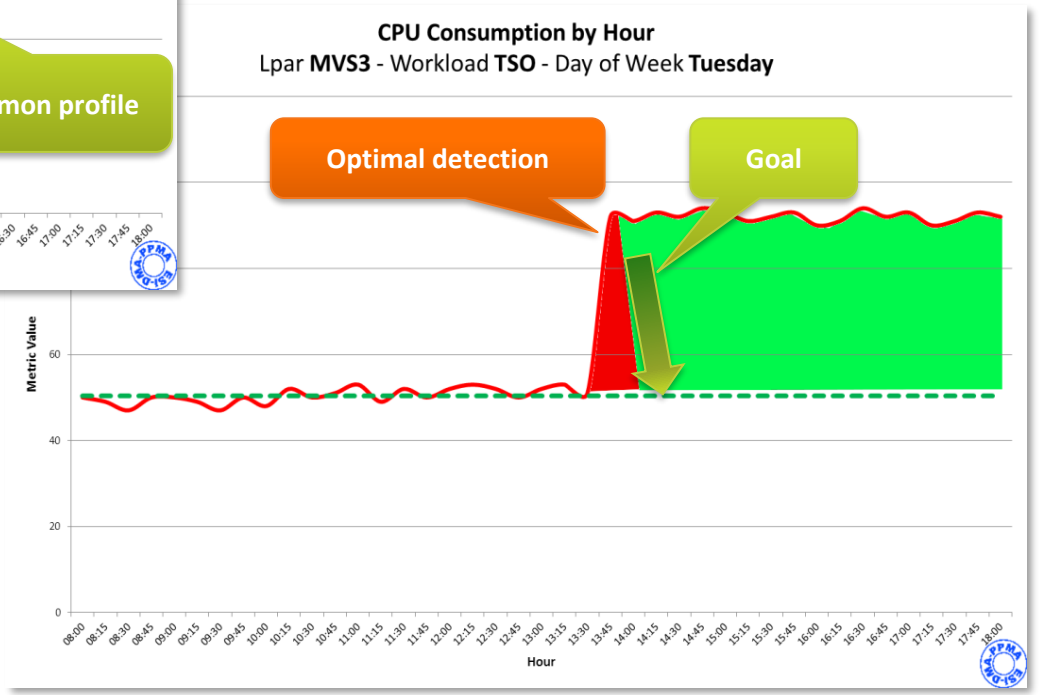
The Problem & Our Goal



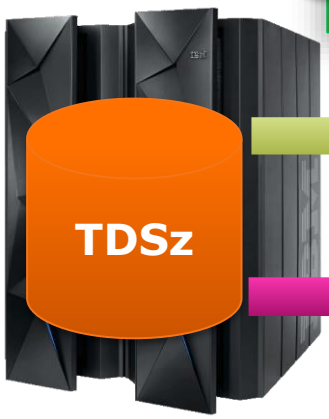


STEEDd - Synthesis

1 Exception Detection

2 eMail Alert sending

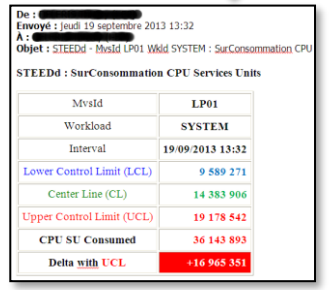
B Collect & Analyse



STEEDd Exit

STEEDd Program

Statistical Model



A Statistical Model establishment

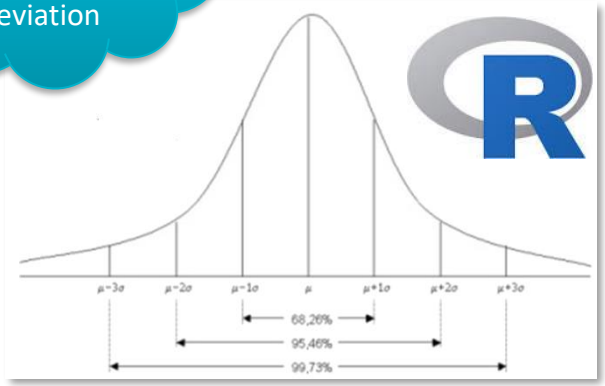
3 Exception characterization

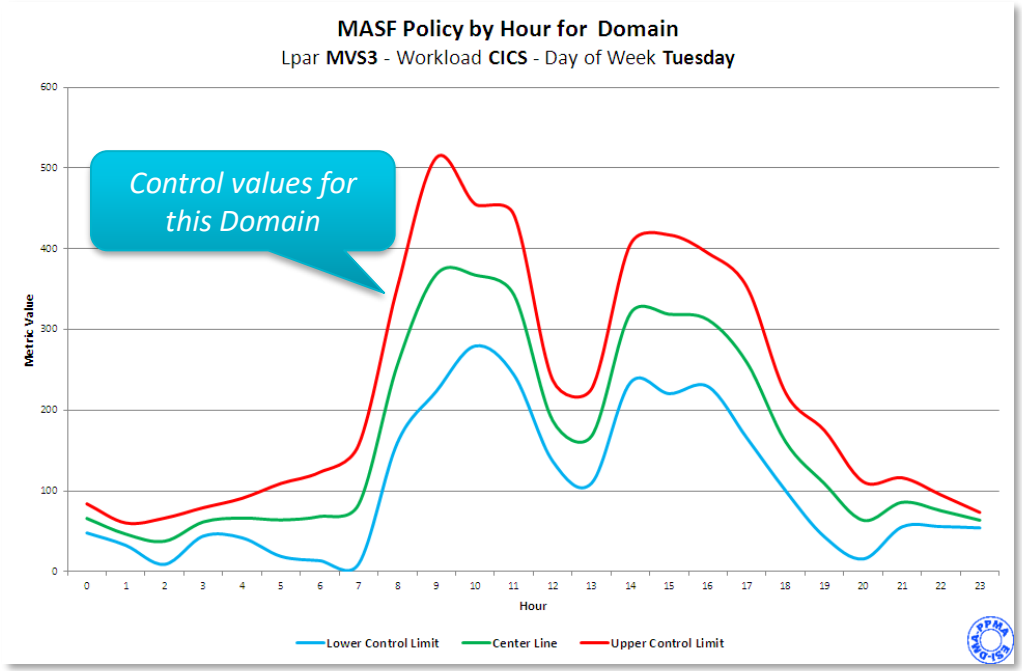
4 Adjustment for correction

STEEDd : A Statistical Model establishment

- Analyse of **TDSz** historical datas (6 months of available datas) with the following method :
  - **Aggregation** of the reference historical datas by retained Domains
    - *Example : Week day, Hour, Lpar, Workload*
  - **Statistical filtering** by Domain, to exclude past outliers from calculation
  - **Statistical Model establishment** with control values calculation for each Domain
    - ***LCL** (« Lower Control Limit ») = μ - 3σ*
    - ***CL** (« Center Line ») = μ*
    - ***UCL** (« Upper Control Limit ») = μ + 3σ*

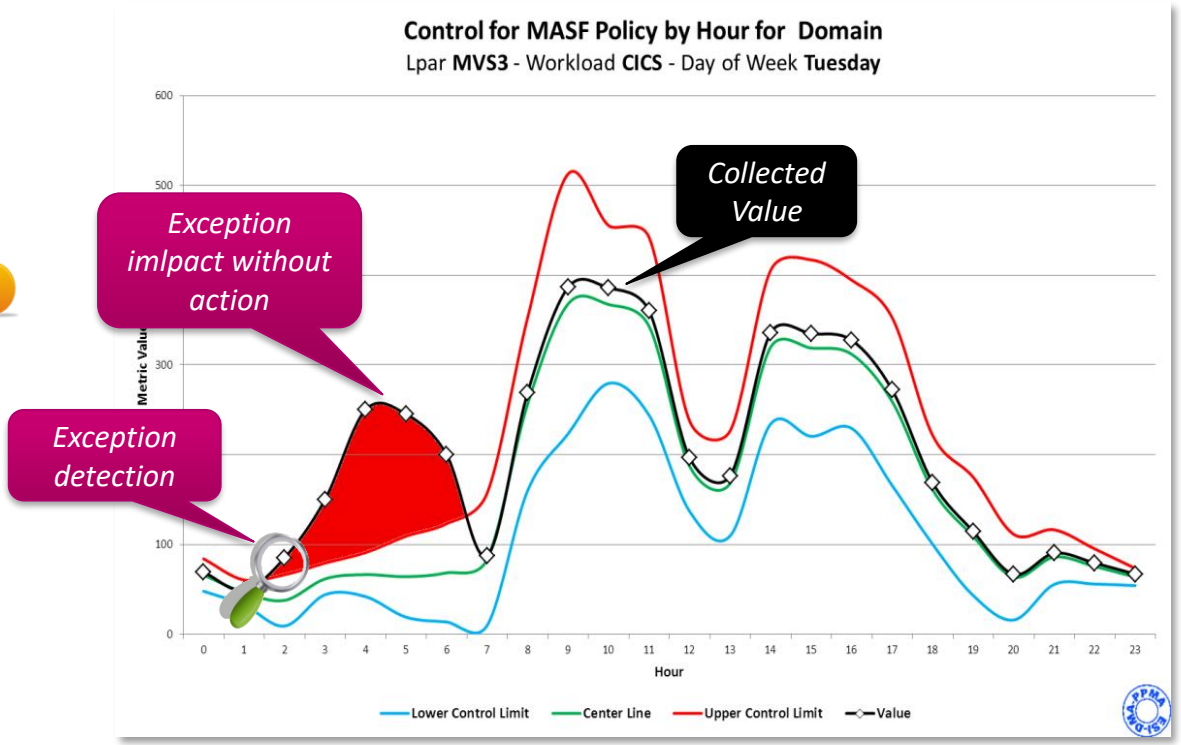
μ : Arithmetic Average
σ : Standard Deviation





STEEDd : B Data Collect & Analysis

- **For each retained Domain,** analyse with a « Near-Real Time » Exit with the following method :
  - **Collect** of the last interval of time value
  - **Use of control chart** to compare the collected value with the coresponding control values, as defined in the refernce Statistical Model
    - *If **Collected Value > UCL** or **Collected Value < LCL** then **Exception Detection***
- If **Exception Detection** then :
  - *Exception's Impact evaluation*
  - *Alert eMail sending*
  - *Domain State evolution*



CICS Monitoring

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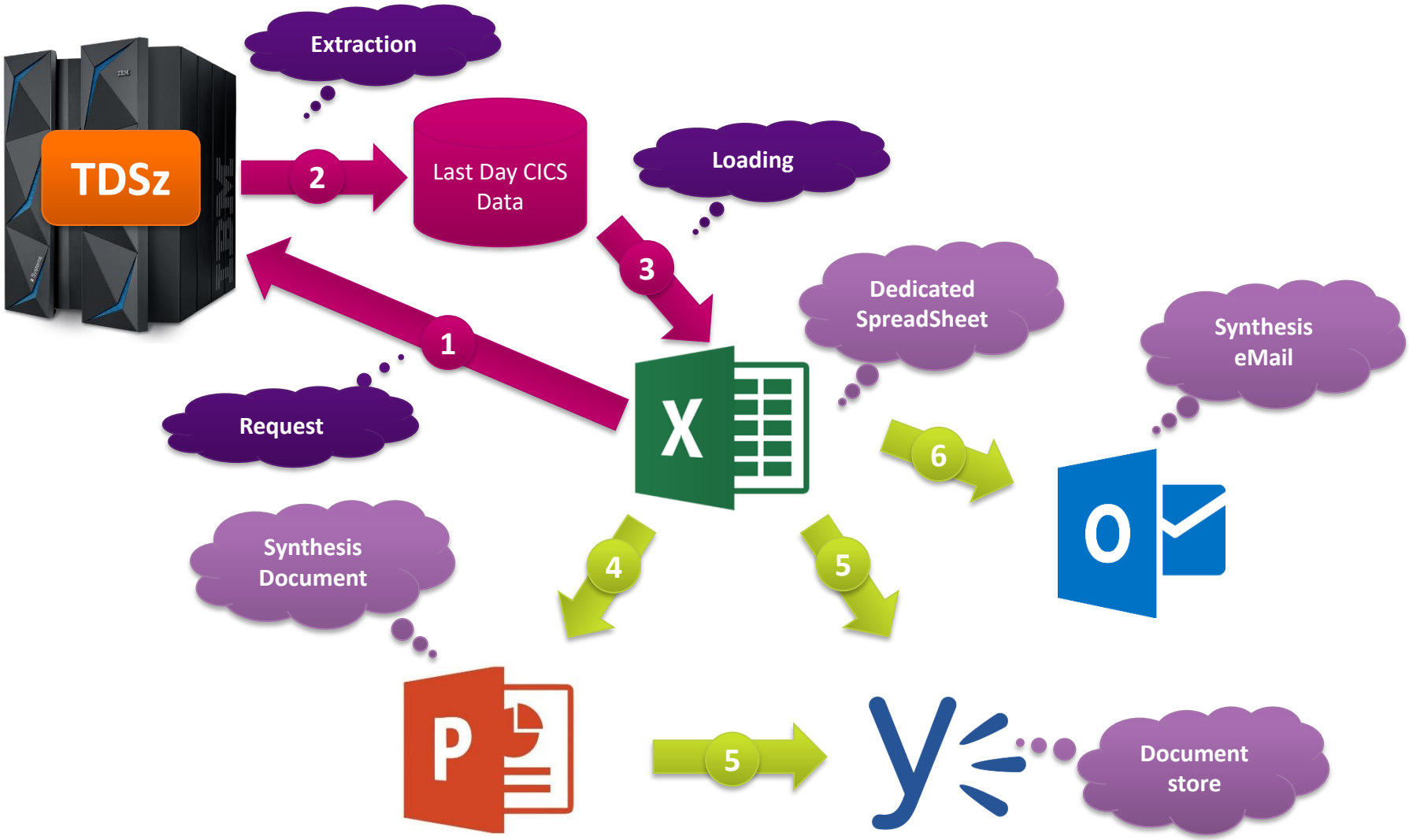
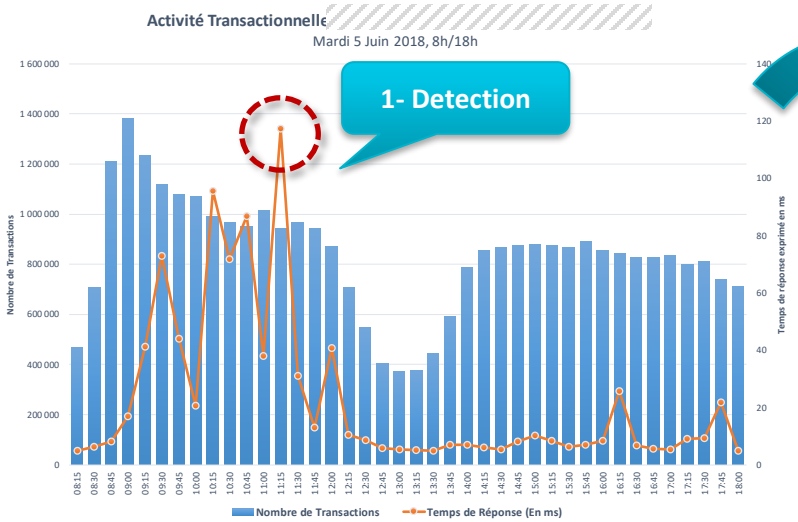
CICS Monitoring



CICS Monitoring - Example



2- Consolidation

Synthèse Qualité de Service CICS
Mardi 5 Juin 2018, 8h/18h

Catégorie	Transaction de référence	Seuil QoS en ms	Instance	QoS
Banque à Distance		200	IP1	100%
			IP2	100%
			IP3	100%
Poste de Travail		400	IP1	100%
			IP2	100%
			IP3	100%

Partition	Seuil QoS en ms	QoS
	100	100%
	100	100%
	100	100%
	100	98%
	100	

3- Synthesis

Synthèse Qualité de Service CICS
Mardi 5 Juin 2018, 8h/18h

Instance	QoS
	100%
	100%
	100%

Partition	QoS
	100%
	100%
	100%
	98%
	100%

4- Publication

CICS Predictive Analysis

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CICS Predictive Analysis

Extraction

1

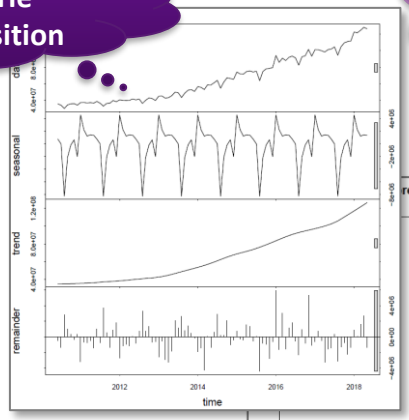
Last Month CICS Data

1

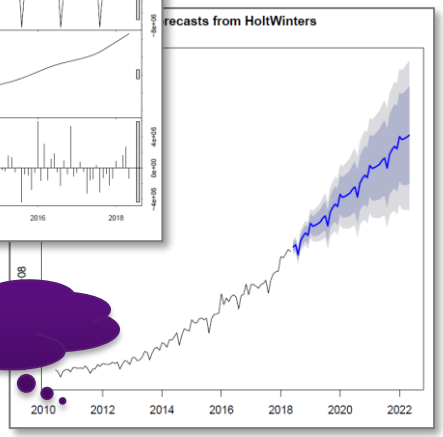
Detailed CICS Historic

Data granularity and retained metrics clearly defined

Time serie Decomposition



Forecasting



Study of historical data metrics to establish forecasting

2

3

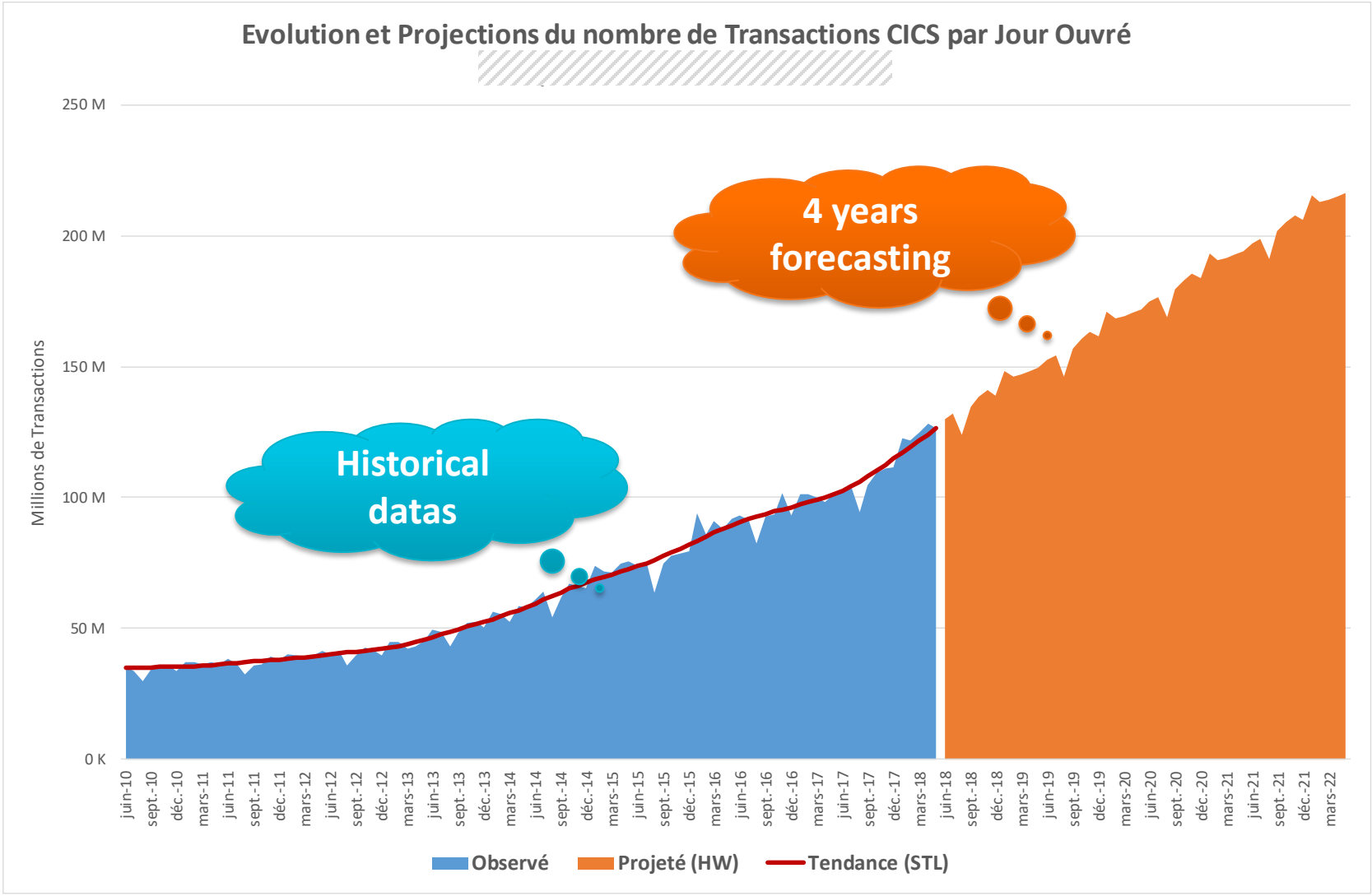
4

Forecast Data synthesis

CICS Data Synthesis

R program execution

CICS Transactionnal Activity Forecasting – Example



Capacity Planning z

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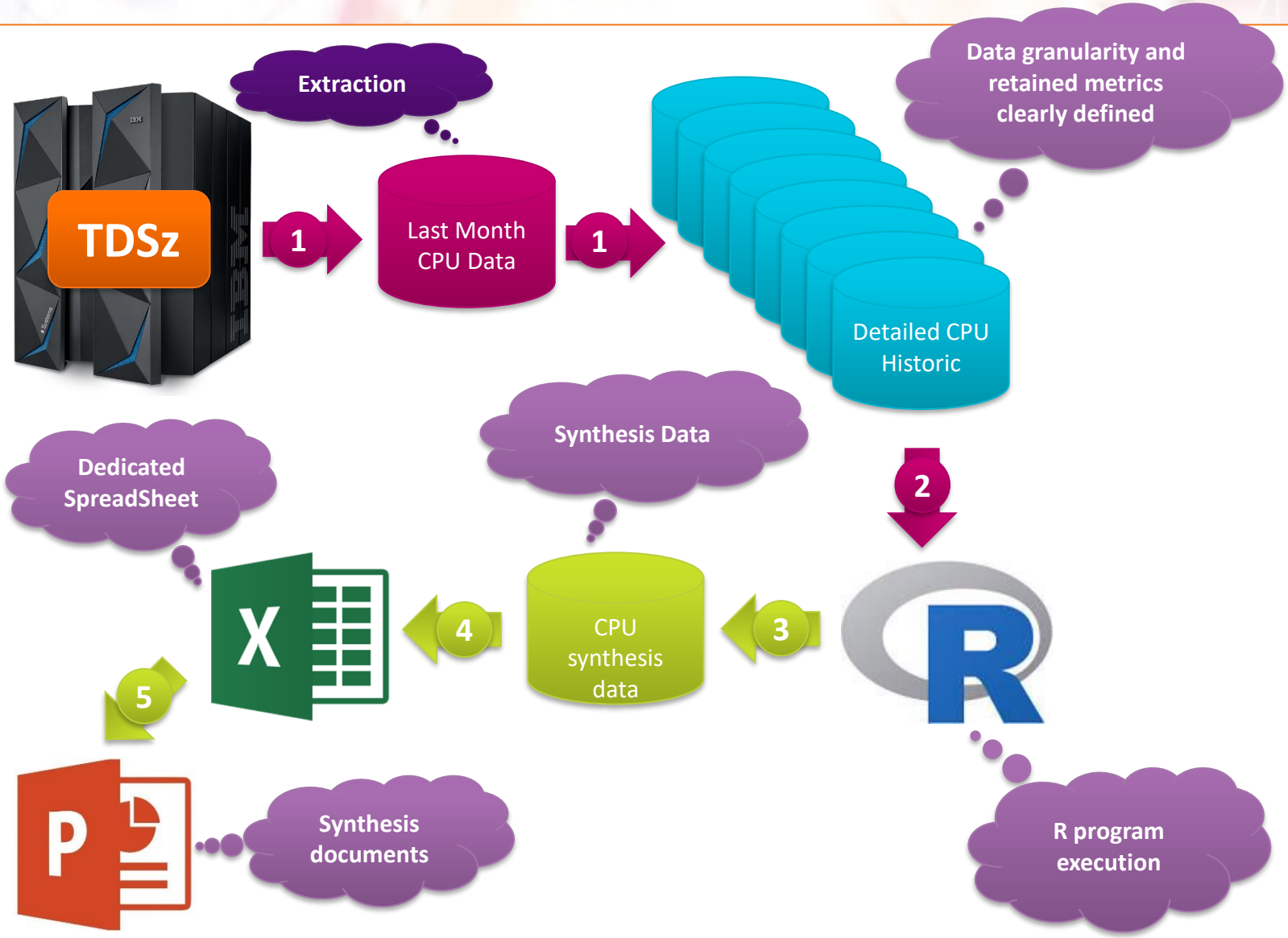
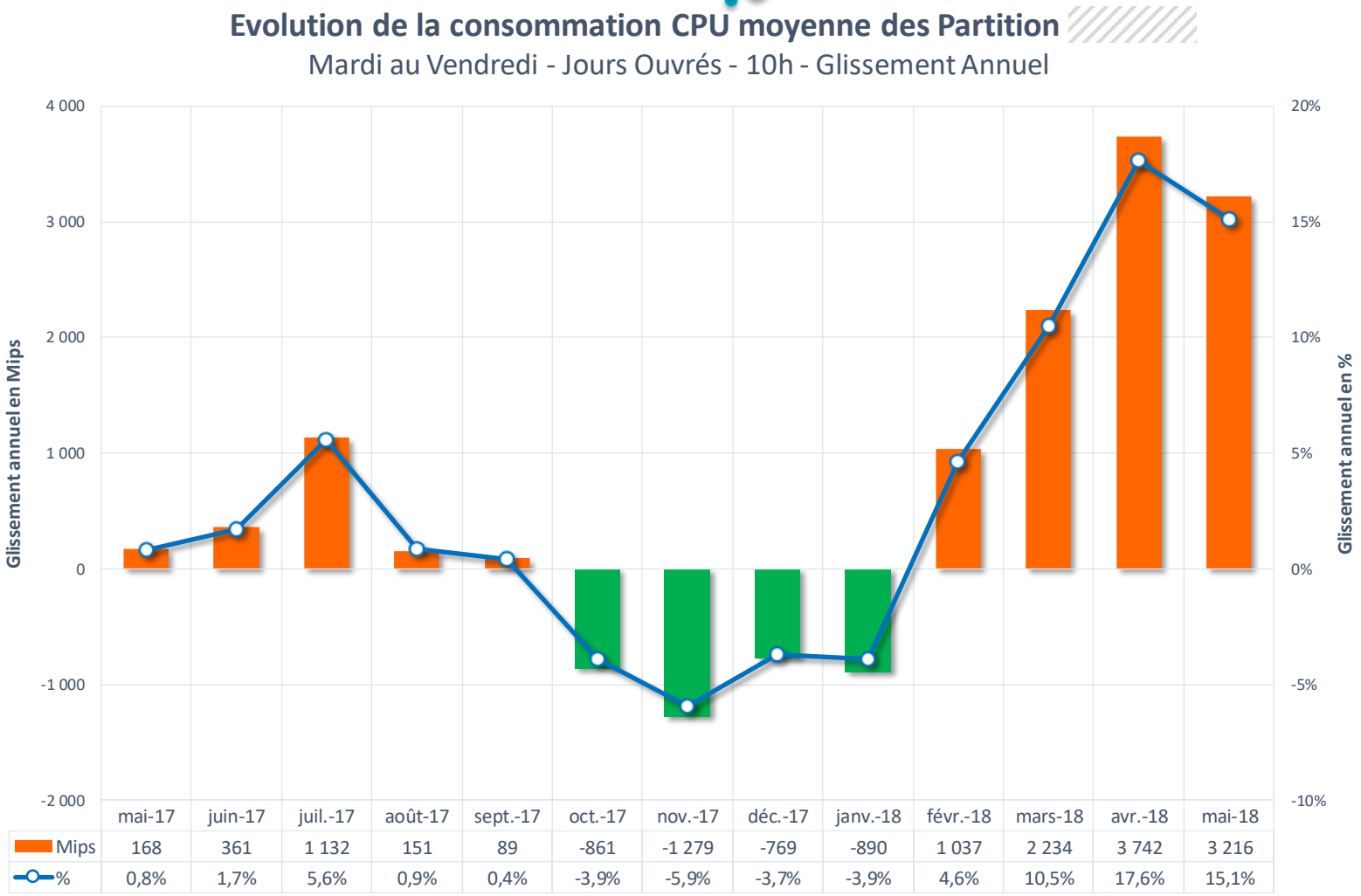
Capacity Planning z



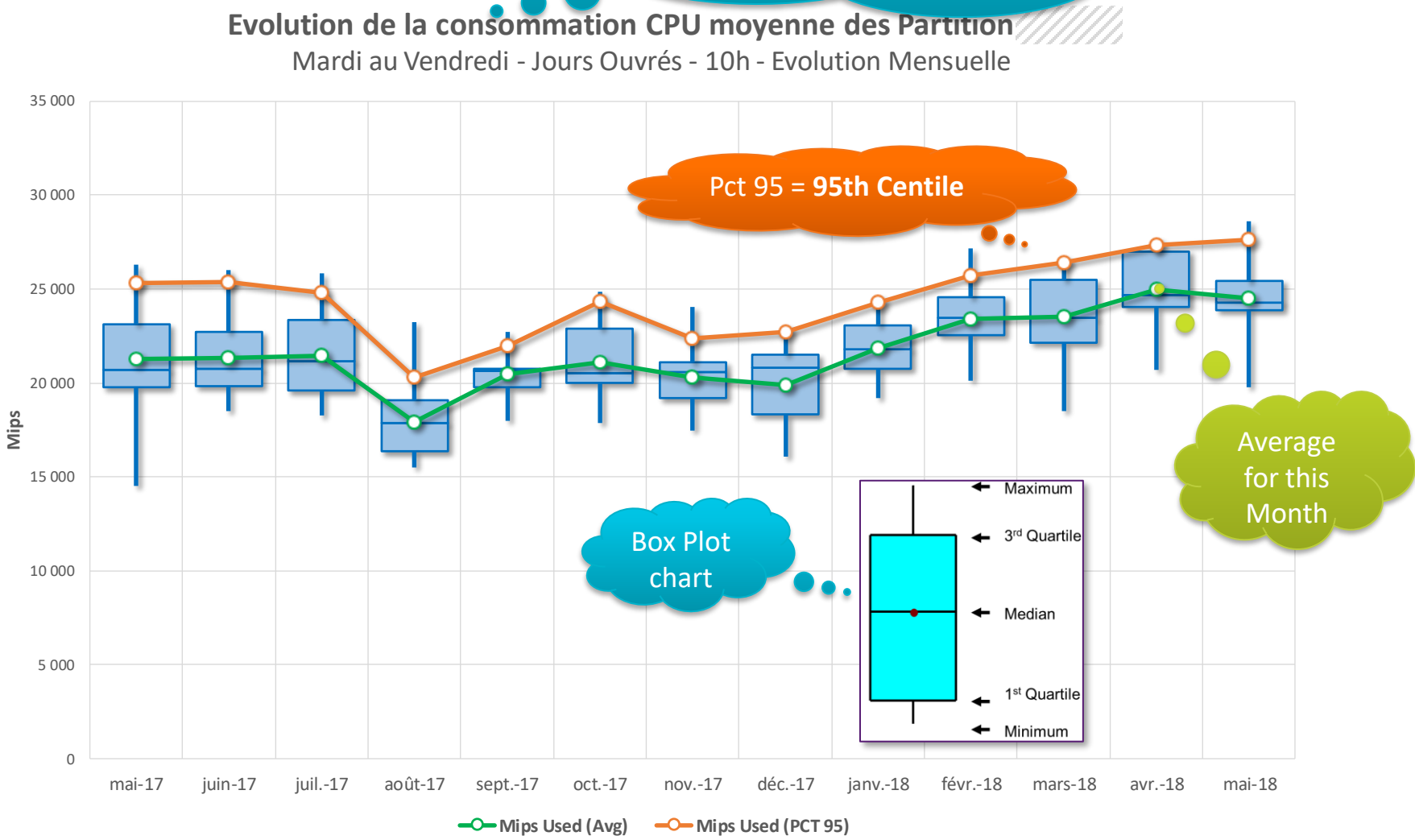
Results - Examples

MIPS consumption on open day at 10 o'clock in the morning
➔ Annual growth for a group of LPAR



Results - Examples

MIPS consumption on open day at 10 o'clock in the morning
➔ Monthly profile & growth for a group of LPAR



SCRT Peak Analysis

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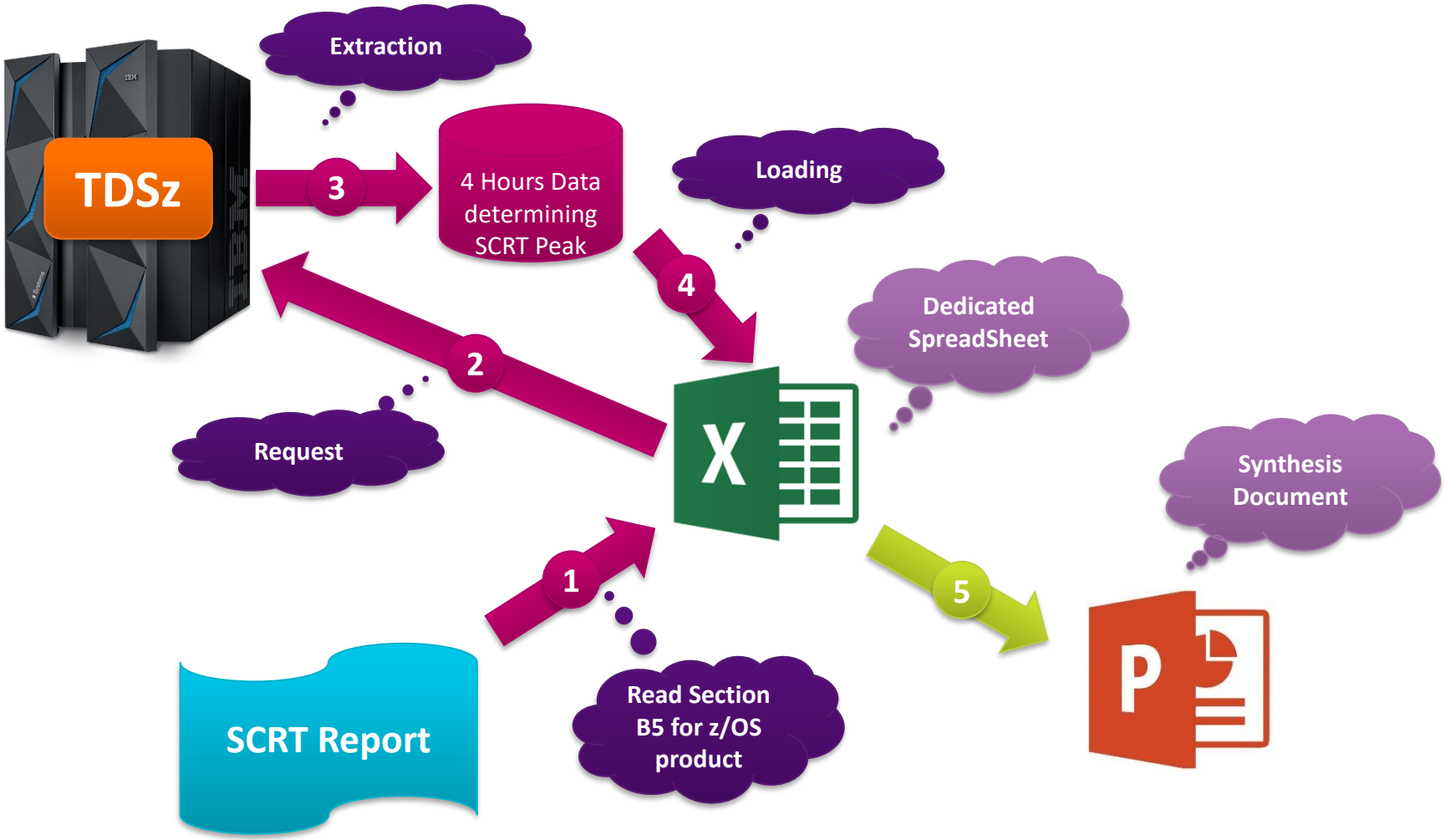
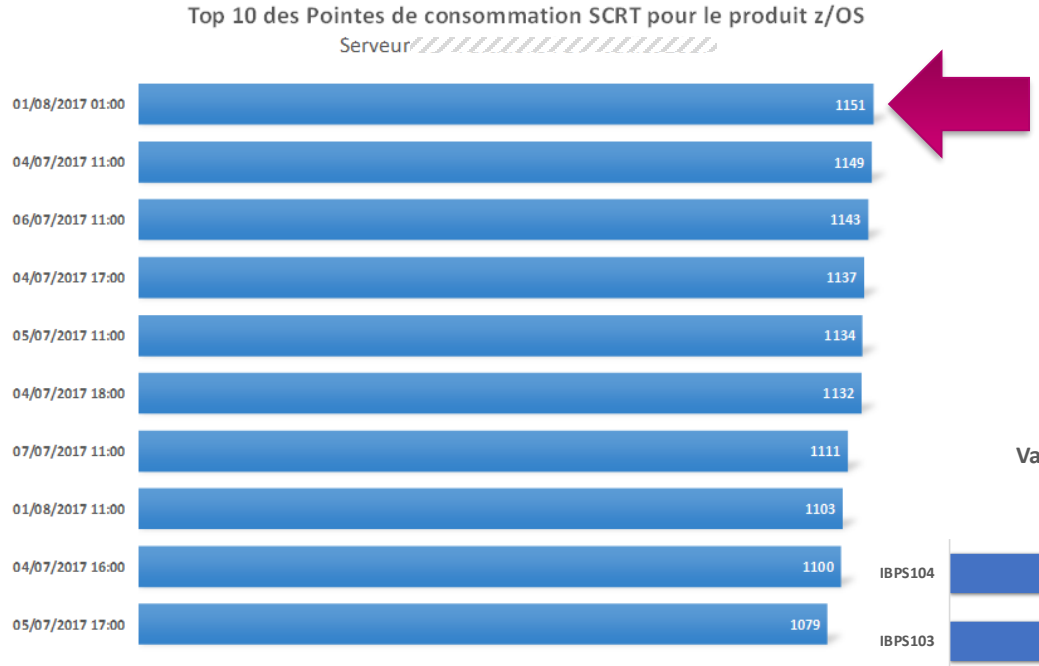
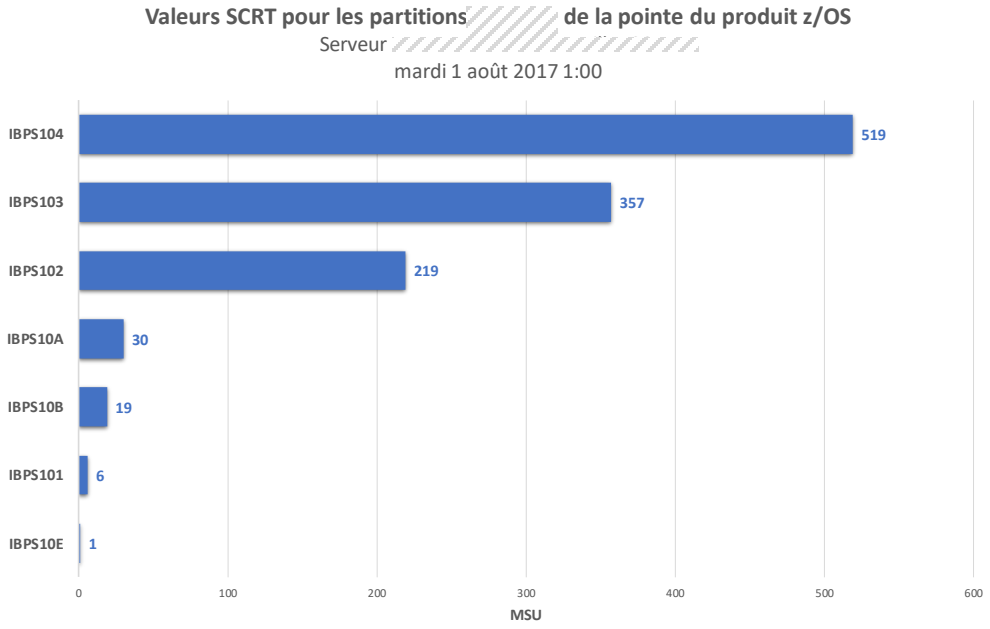
SCRT Peak Analysis



SCRT Peak Analysis - Example





Top 20 Adress Spaces consumers of GCP MSU during the SCRT determining 4 Hours - Example

Traitement	Workload															Total	
		MSU	%	MSU	%	MSU	%	MSU	%	MSU	%	MSU	%	MSU	%	MSU	%
$*FCLM70	BATCH	26	2,2%	18	1,5%	6	0,5%									50	4,2%
$*WEBM30	BATCH	25	2,1%	9	0,7%	6	0,5%									39	3,3%
$*OPBJA0	BATCH	23	2,0%	8	0,7%	7	0,6%									39	3,3%
$*EXCJP1	BATCH	11	0,9%	8	0,7%	2	0,2%									21	1,7%
$*OMPR0J	BATCH	7	0,6%	6	0,5%	6	0,5%									19	1,6%
$*GPRM23	BATCH	4	0,3%	2	0,2%	2	0,1%	9	0,8%							17	1,4%
$*CLTH6N	BATCH	7	0,6%	6	0,5%	3	0,3%									16	1,4%
$*CLTH6L	BATCH	6	0,5%	5	0,5%	3	0,2%									14	1,2%
$*CLTH5N	BATCH	8	0,6%	4	0,3%	2	0,1%									13	1,1%
$*FCLM10	BATCH	6	0,5%	4	0,3%	2	0,2%									12	1,0%
CICSBPN	STC	11	1,0%													11	1,0%
$*CLTH6K	BATCH	5	0,4%	5	0,4%	2	0,1%									11	0,9%
$*ACQJG4	BATCH	5	0,5%	2	0,2%	2	0,1%									10	0,8%
CATALOG	SYSTEM	3	0,3%	3	0,3%	2	0,2%	1	0,1%	0	0,0%	0	0,0%	0	0,0%	9	0,8%
$*OPBR14	BATCH	4	0,3%	4	0,3%	2	0,1%									9	0,8%
CICSBPM	STC	8	0,7%													8	0,7%
$*EDHJ10	BATCH	5	0,4%	2	0,1%	1	0,1%									8	0,7%
$*GPRM12	BATCH	5	0,4%	1	0,1%	2	0,2%									8	0,6%
$*ITRR54	BATCH	3	0,2%	3	0,3%	2	0,2%									7	0,6%
DSPMSTR	STC	4	0,3%	3	0,2%	1	0,1%									7	0,6%
Total sélection		**176**	**14,7%**	**91**	**7,7%**	**51**	**4,3%**	**10**	**0,8%**	**0**	**0,0%**	**0**	**0,0%**	**0**	**0,0%**	**329**	**27,6%**
Total général		**527**	**44,2%**	**372**	**31,2%**	**222**	**18,6%**	**48**	**4,1%**	**18**	**1,5%**	**4**	**0,3%**	**1**	**0,1%**	**1 192**	**100,0%**

These 6 Adress Spaces represents **15,5%** of the GCP MSU consumption during the determining 4 Hours

These 20 Adress Spaces represents **27,6%** of the GCP MSU consumption during the 4determining 4 Hours

GROUPE BPCE

Coopératifs, banquiers et assureurs autrement.