



TDS Migration at SIX Group Zürich, Switzerland

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Agenda



- Company presentation
- Infrastructure
- The EPV project
- Final statements

Stability for the financial sector

SIX operates the infrastructure of the Swiss financial center and is constantly making improvements. The systems are built to cope with massive workloads and are stable, secure and reliable.

6.7 billion

price updates are produced by SIX every day.

141 terabyte

of **back-up copies** are stored daily.

99.6 billion

francs were raised on the stock exchange by companies in 2015.

2 million

times a day, SIX is the **central counterparty** in **clearing** securities transactions.

5.4 billion

francs are traded every day on the regulated stock exchange.

9.3 million

transactions with credit and debit cards are processed by SIX every day.

160 billion

francs flow backwards and forwards in interbank payments each day.

3,100 billion

francs is the amount SIX currently manages as central securities depository for Swiss securities.

Fast, slick and reliable

Every day, the systems at SIX process vast quantities of data.

192 million

francs are processed daily in credit and debit card transactions.

20 million

financial instruments are covered in the SIX data universe.

2.8 petabyte

of **storage capacity** are managed in the data processing center.

A diversified business model

Swiss Exchange



Reference market for about **35,000 securities**

Leading exchange for **life sciences** in Europe

Broad offering in the area of **exchange-traded funds** (1000)

Self-regulation under Swiss law

Securities Services



Provides an integrated range of **post-trade services** that are key for Switzerland's financial market

International securities depository and custodian in **over 65 markets**

Operates Securities Finance and Payment platforms for the **Swiss National Bank**

Operates the platform for the electronic processing of **land registry** and **mortgage transactions**

Offers **e-bills** and **direct debits**

Financial Information



Leading provider of **financial information** in Europe

Leader in the area of **reference data**

International presence in **23 countries**

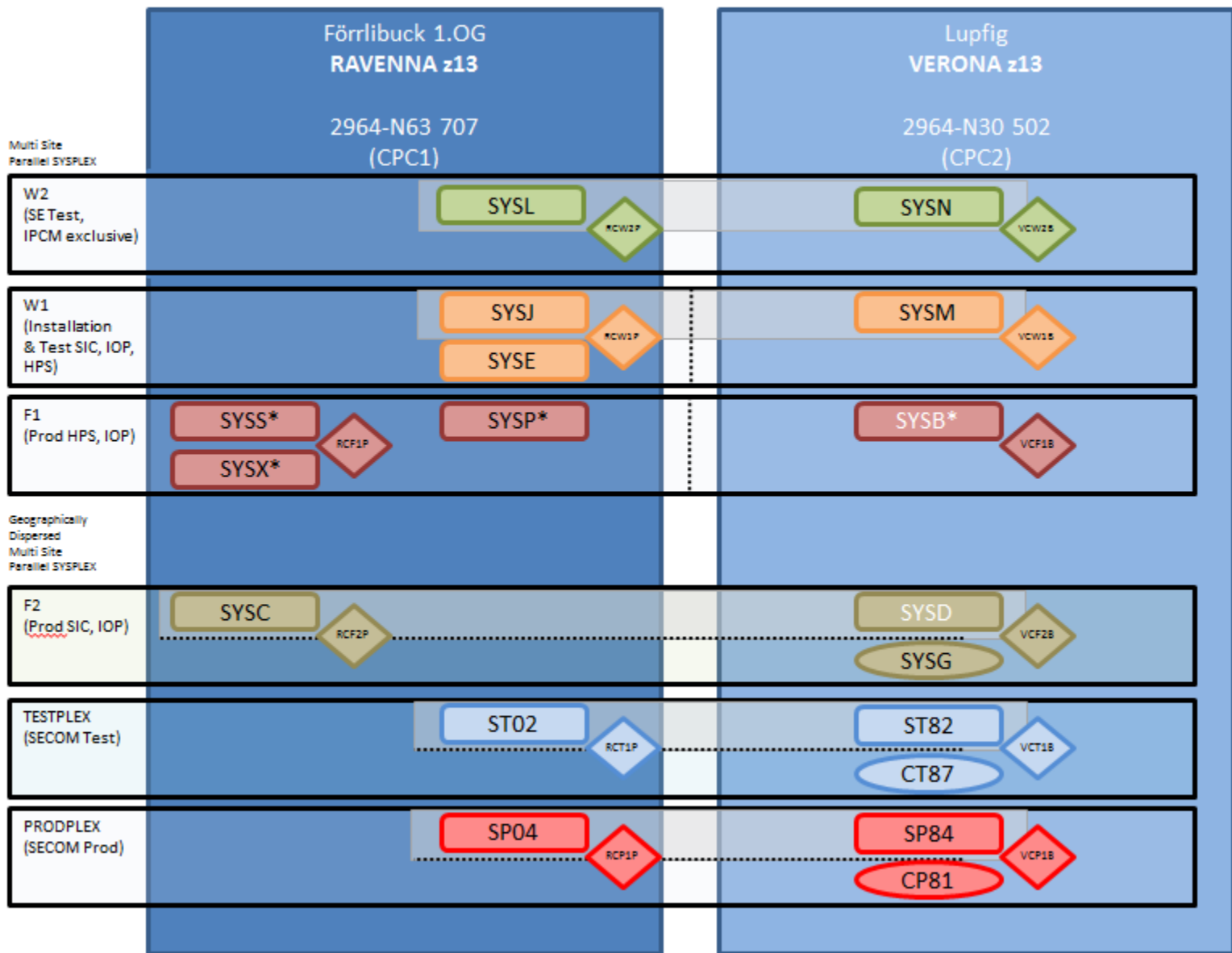
85 years' experience in the financial information business

Payment Services



Market leader in the **acquiring** and **processing of cards** in Switzerland, Austria and Luxembourg and market leader in **card issuing** in Austria

Leading one-stop provider of efficient solutions for **cashless payments**



SIX Software products

- Software products in use
- z/OS 2.1 (z/OS 2.2 is planned)
- DB2 V11
- CICS 5.2
- MQ V8
- SA for OS/390 and GDPS
- BMC CMF and Mainview

SIX EPV target system

- **System virtualized with VMWare**
 - **Windows 2008 R2 SP1**
 - **Quad 2.3 GHz**
 - **16 GB RAM**
- **MySQL V5.7.9**
- **InternetExplorer V11.0.9600.18349**
- **Disk space usage**
 - **SMF-Input: 13GB (18 MVS images, 7 CICS / 7 DB2 / 7 MQ)**
 - **MySQL-Size: 60GB**
 - **HTML-Reports: 27 GB**
- **Run times**
 - **Parsing: 2h 15min, in sequential mode**
 - **Nightbatch_ZOS: 1h 50min**
 - **Nightbatch_zGraph: 5min**
- **SMF interval: 1 hour**

SIX TDS Migration Project

- Migration Project
 - For installation 1 week needed
 - Custom Report
 - An important TDS accounting report had to be reengineered (workaround for CICS report needed)
 - After 2 month fully operational
 - A successful project

Quick CPU shortage

EPV - CPU UTILIZATION - Mozilla Firefox
file:///mpzhwfts01/F/HTML/ZOSDOC/MRCPUBSY.HTML

Whatever metric has been selected, cell background is red when:

- the CPU capacity used by the PHYSICAL partition is greater than the threshold (see Note 4).
- the available CPU capacity of the CEC is less than the threshold (see Note 5).
- the CPU utilization of a partition is greater than the threshold (see Note 6)
- the difference between MVS BUSY utilization and CPU BUSY utilization is greater than the threshold (see Note 7). There indicator of contention, and generally means that the partition is suffering.

[CPU UTILIZATION](#)
 [AAP UTILIZATION](#)
 [IIP UTILIZATION](#)
 [IFL UTILIZATION](#)
 [MEMORY UTILIZATION](#)
 [PAGE FAULT RATE](#)
 [HV COMM/SHR UTILIZATION](#)
 [XCF CTC INBOUND RESPONSE TIME](#)
 [CF SYNC REQUESTS ELAPSED TIME](#)
 [PA](#)
 [CF AS](#)

CPU UTILIZATION MIPS

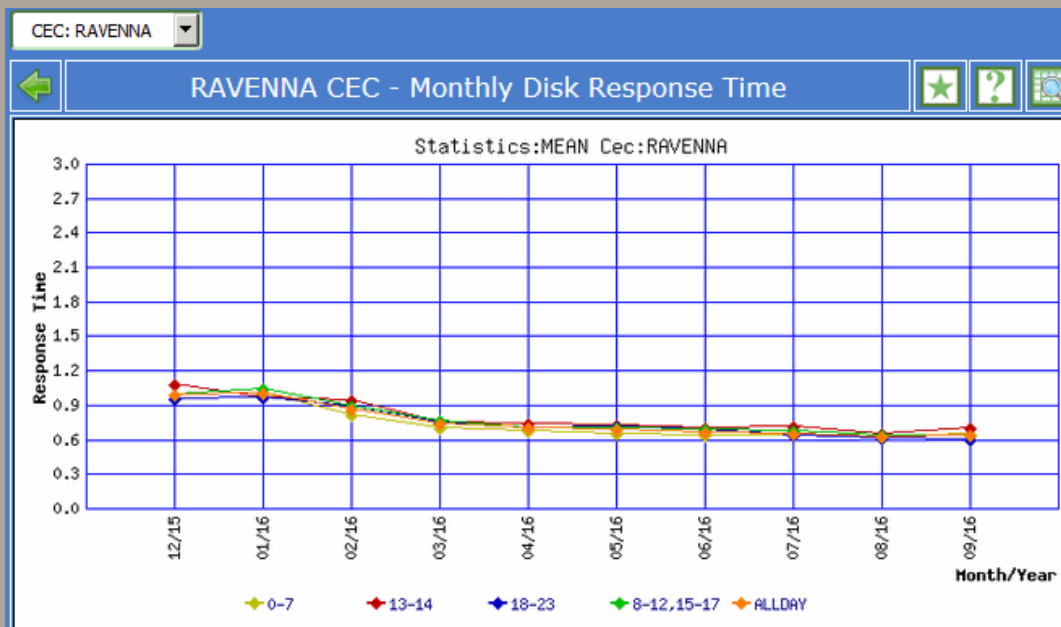
MIPS BY HOUR Tue, 12 Jul 2016

CEC	LPAR	SYSTEM	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
RAVENNA	PHYSICAL		62.5	49.7	48.3	42.7	51.5	50.5	46.6	57.9	50.3	65.6	59.8	68.7	69.4	74.3	72.4	70.4	66.7	61.9
RAVENNA	LP02	ST02	363.8	243.4	166.1	185.2	271.5	555.3	567.7	1'235.9	1'302.7	1'146.5	837.4	1'287.8	1'305.2	767.9	761.6	617.8	628.4	888.4
RAVENNA	LP04	SP04	1'516.7	552.5	450.1	175.1	281.7	349.0	675.5	903.9	735.9	2'444.8	2'705.1	2'179.4	2'114.9	2'159.2	2'361.8	2'981.6	2'587.0	1'541.7
RAVENNA	SYSC	SYSC	169.5	274.2	390.0	270.5	116.3	113.0	135.3	157.9	119.8	116.2	147.4	153.5	149.7	142.6	203.7	135.0	142.0	165.0
RAVENNA	SYSE	SYSE	1'354.8	1'291.0	1'309.9	1'354.1	1'811.0	1'464.4	1'458.8	1'479.8	1'663.3	1'554.1	1'483.2	1'643.5	1'953.1	1'696.6	1'456.9	1'368.6	1'601.9	1'541.8
RAVENNA	SYSJ	SYSJ	233.6	117.6	70.6	172.1	82.7	142.8	330.4	319.0	150.7	118.8	139.1	108.3	111.1	106.7	191.0	81.9	81.7	81.6
RAVENNA	SYSL	SYSL	24.4	21.3	20.3	20.5	23.0	21.0	20.3	27.5	24.6	27.7	24.8	37.8	25.9	22.9	26.2	23.3	22.3	22.0
RAVENNA	SYSP	SYSP	1'251.5	2'784.4	1'308.5	1'279.5	2'166.6	1'649.8	902.7	2'133.0	958.6	2'282.8	2'869.1	1'775.8	1'477.8	1'641.0	1'340.4	1'882.5	1'912.3	1'917.4
RAVENNA	SYSS	SYSS	238.5	627.7	69.9	65.9	917.3	271.9	71.8	94.6	135.1	210.2	413.9	353.9	100.0	86.1	90.4	388.2	94.0	86.9
RAVENNA	SYSX	SYSX	1'851.5	1'947.9	2'672.9	2'689.3	2'434.5	2'522.4	2'652.4	2'143.3	1'718.4	1'445.3	1'115.1	1'746.3	1'867.8	1'611.3	848.0	596.9	722.4	451.7
(RMF)	USED		7'067.0	7'909.6	6'506.7	6'254.8	8'156.2	7'140.1	6'861.5	8'553.0	6'859.4	9'412.0	9'794.8	9'355.0	9'174.8	8'308.5	7'352.4	8'146.2	7'858.7	6'758.4
	AVAILABLE		2'897.3	2'054.7	3'457.6	3'709.5	1'808.1	2'824.2	3'102.8	1'411.3	3'104.9	552.3	169.5	609.3	789.5	1'655.8	2'611.9	1'818.1	2'105.6	3'205.9



Replacement of 2 DASD controllers

MONTH	0-7	13-14	18-23	8-12,15-17	ALLDAY
12/2015	0,81	0,82	1,12	0,81	0,89
01/2016	0,82	0,82	1,16	0,85	0,91
02/2016	0,79	0,79	1,12	0,78	0,87
03/2016	0,63	0,68	0,84	0,72	0,72
04/2016	0,56	0,72	0,71	0,66	0,64
05/2016	0,56	0,73	0,72	0,66	0,65
06/2016	0,55	0,68	0,69	0,67	0,63
07/2016	0,56	0,73	0,64	0,65	0,62
08/2016	0,58	0,73	0,67	0,67	0,64
09/2016	0,56	0,76	0,66	0,65	0,63



Final statements

- Requirements
 - Grouping of favourites
 - Own descriptions for favourites
 - Correct Icons or only a list for navigation