



IBM Technical Sap forum

Praktisk SAP virtualisering

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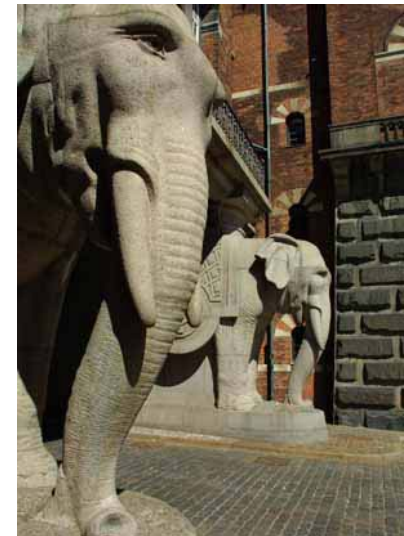


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Opgaver

- Infrastructure design
- Sizing, migration, POC
- Før og efter salgs support
- Consulting
- Uddannelse
- Integration

Historien om elefanten ...





Lidt historie ...



- 1847 10. november 1847 starter produktionen i Valby
- 1868 Bryggerigården brænder men genopføres
- 1871 Udvides bryggeriet med et anneksbryggeri, som sønnen Carl forpagter.
- 1881 Carl opfører "Bryggeriet i Valby" der senere skifter navn til Ny Carlsberg.
- 1901 Elefanttårnet opføres. Arkitekt: Vilhelm Dahlerup
- 1902 Gamle og Ny Carlsberg slås administrativt sammen
- 1906 Navneskift til Carlsberg Bryggerierne.
- 1965 Den 88 m. høje Carlsberg silo opføres
- 1970 Carlsberg og Tuborg fusionerer
- 1979 Fredericia Bryggeri indvies
- 2005 Hus bryggeriet Jacobsen indvies
- 2006 Beslutningen om at flytte ølproduktionen til Fredericia træffes

Project forløb


- ✓ Engagement, - codename: EIF
- ✓ Planning
- ✓ Due Diligence
- ✓ Transformation
- ✓ Realization
- ✓ Handover
- ✓ RFS (Request For Services)

Ikke helt på bar bund ...






- 1994 Første CB SAP
- 1998 Demars
- 2002 Arla
- 2002 Grundfos
- 2002 Lego
- 2003 FACT
- 2004 ISS



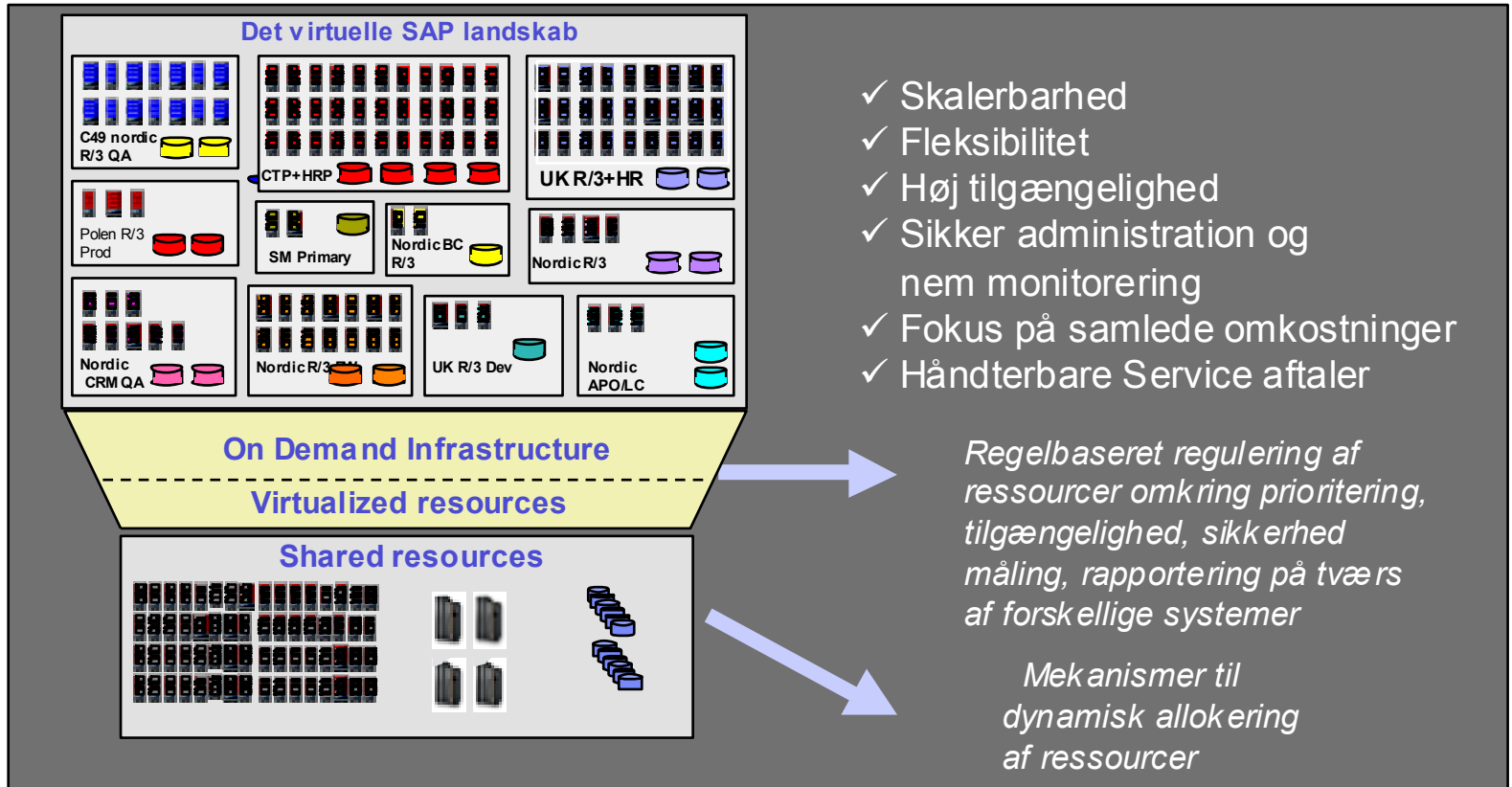
Source systemer, fakta ...

-  > 100 SAP systemer
-  > 150.000 Produktions SAPS
-  > 80 TB Rå data
-  > 16 "Guld" systemer
-  Særdeles heterogene miljøer
-  5 forskellige lande
-  Adskillige regionale lokationer

IBM Visioner ...

-  **Samme kapacitet som source + mindst 30%**
-  **Høj Tilgængelighed på alle Produktive systemer.**
-  **Fleksibel og Dynamisk**
-  **Konsolidering, hvor muligt**
-  **Centralt monitorering og administration af SAP, DB, AIX og interfaces**

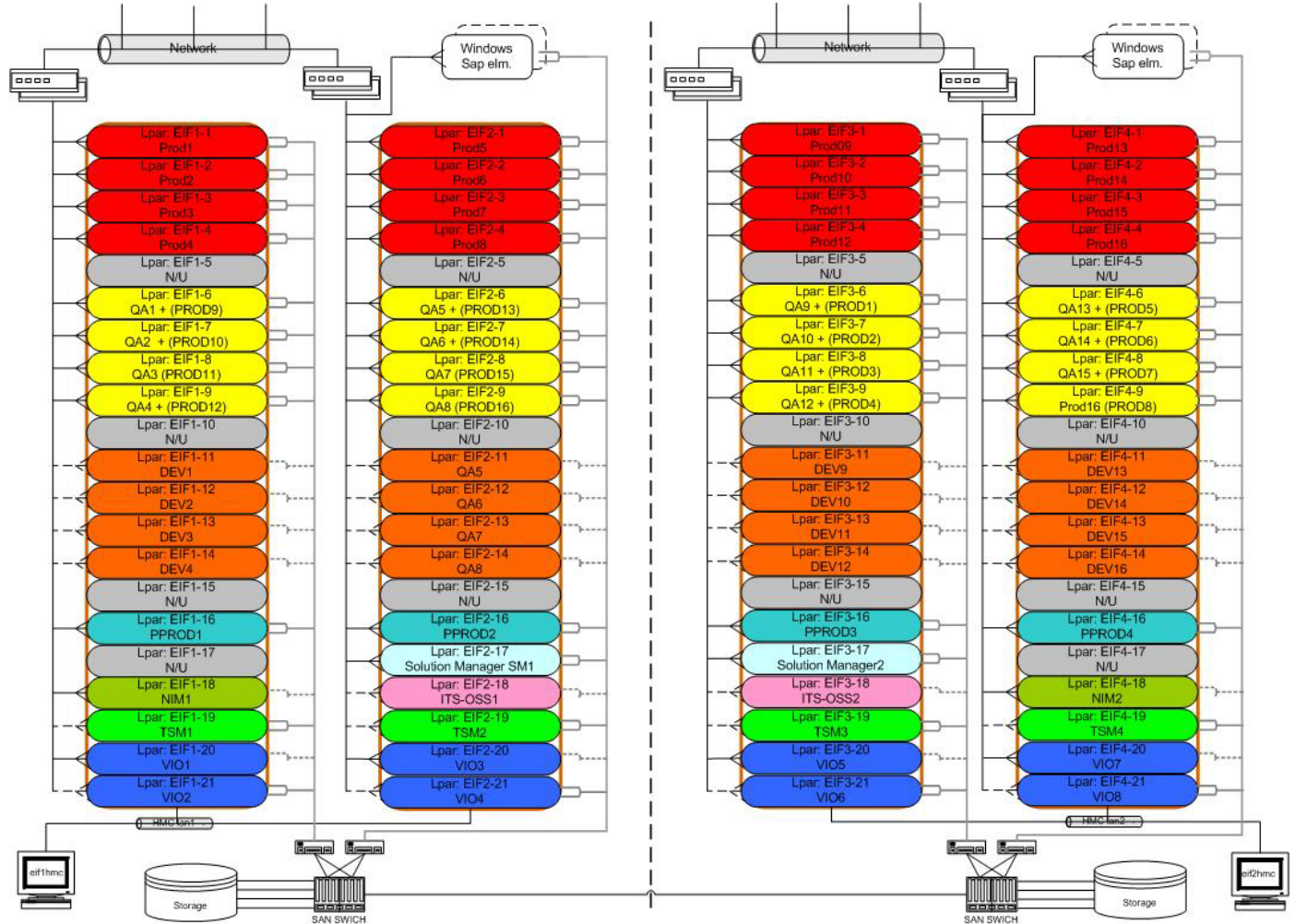
IBM Server Visionen fortsat ...

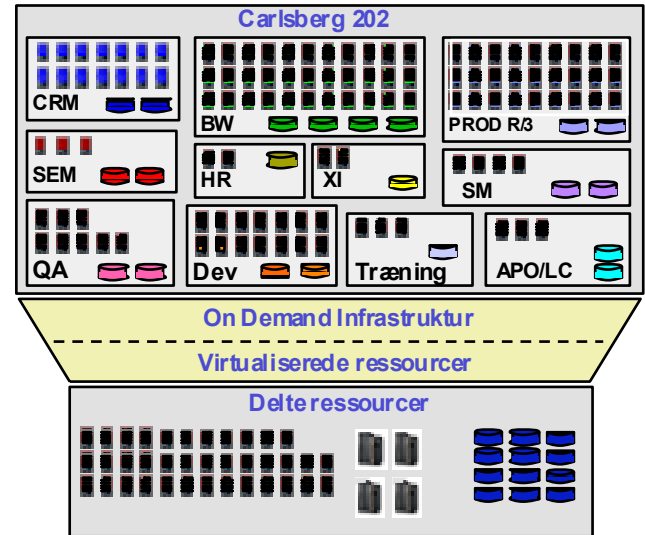
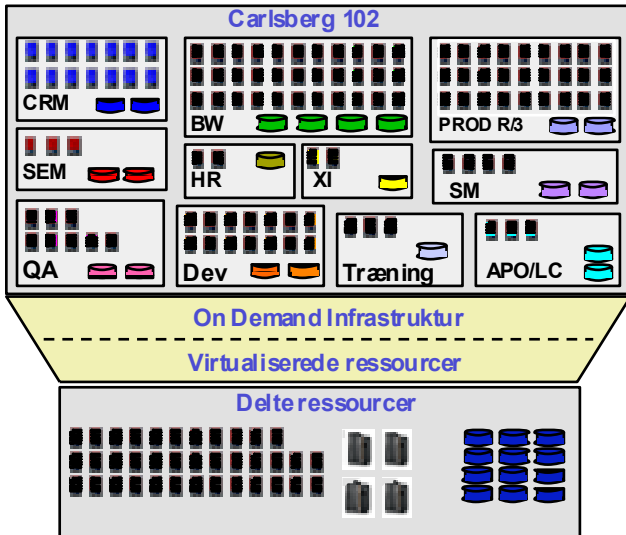
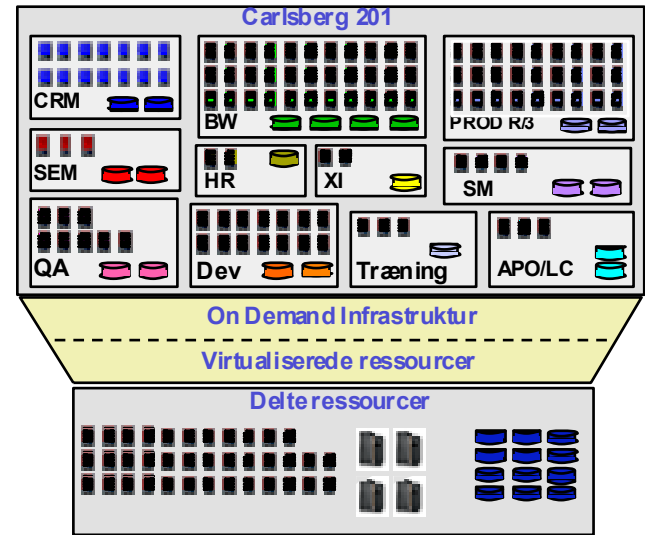
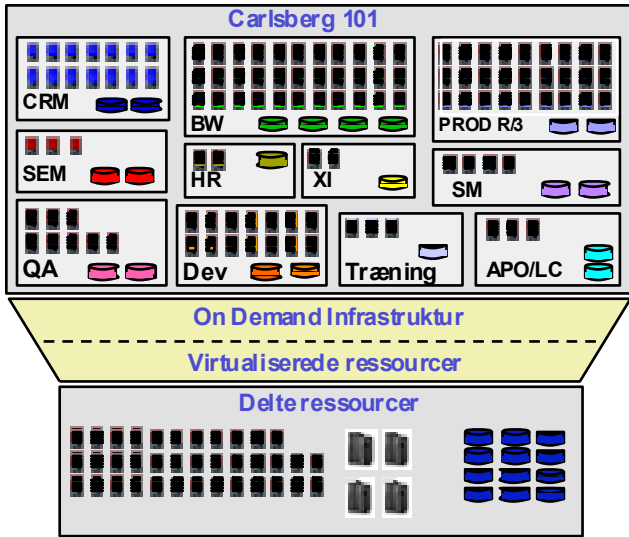


Ressourcer er grupperet, Virtualisering og allokeres dynamisk efter forretningsmæssige behov









Løsnings Oversigt



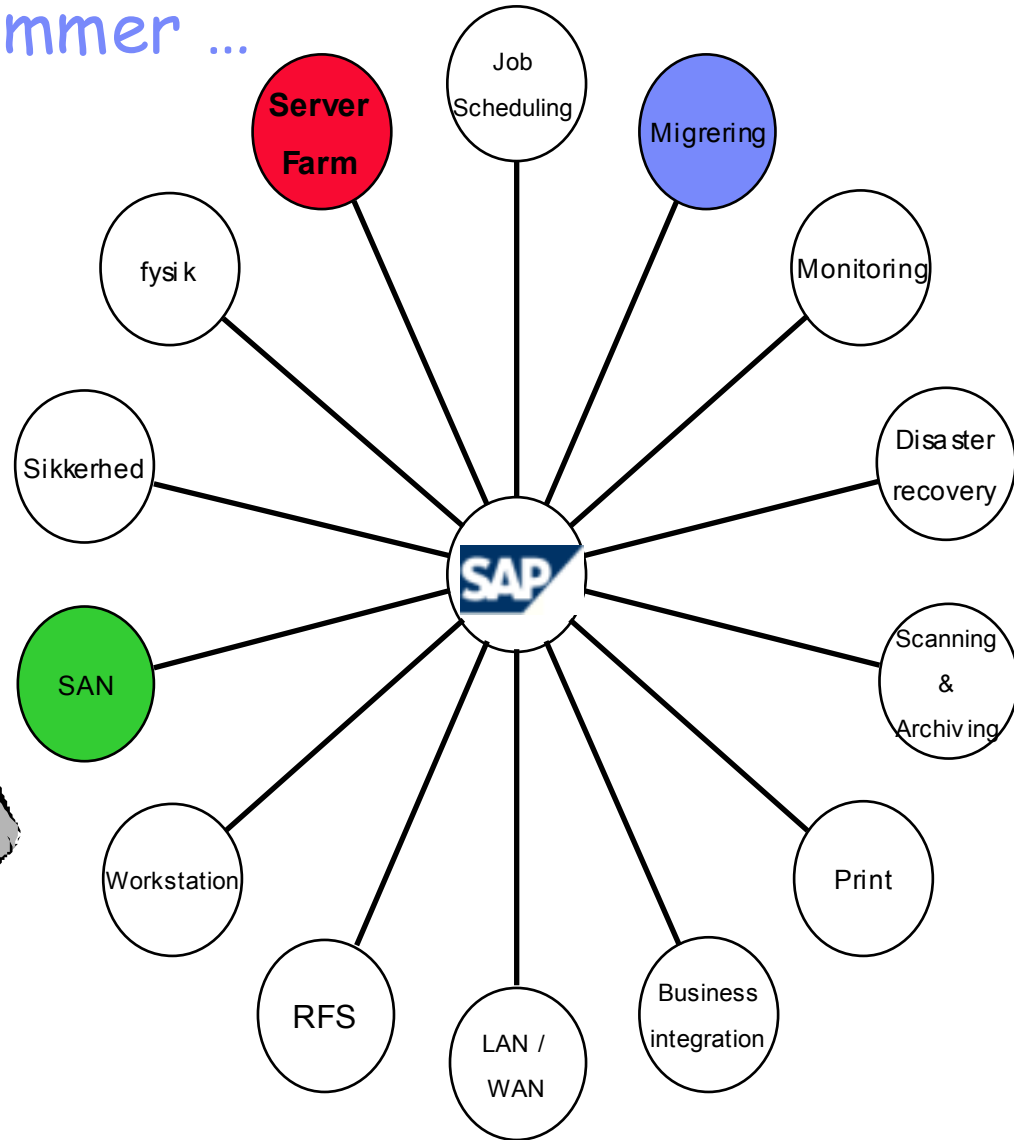
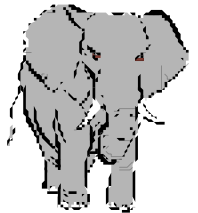
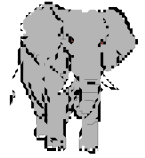
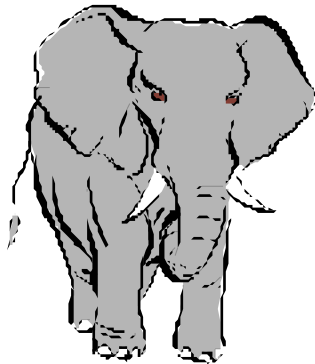
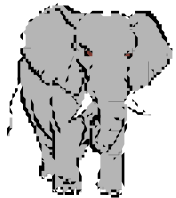
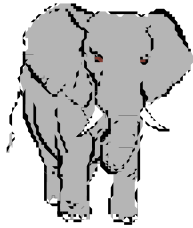
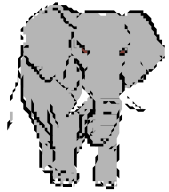




Opgave: Konsoliderer ...

-  256 p5 1,9 Ghz CPU (2x2 595)
-  >100 SAN adapterer
-  >200 LAN adapterer
-  4 x 1 TB memory
-  > 80 TB Disk 4 x DS8100
-  Central CCMS & WLM (PLM)

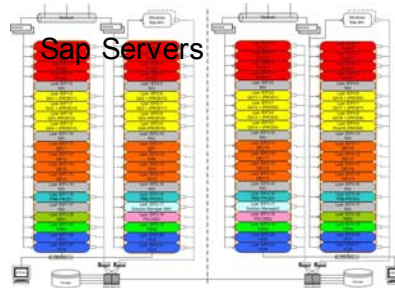
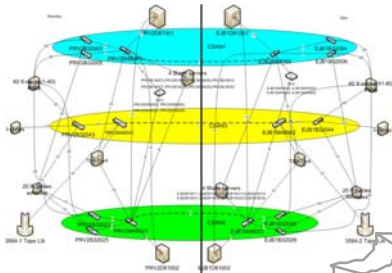
Elefanterne kommer ...



Lokalisering



Storage



Application

Databases

Servers

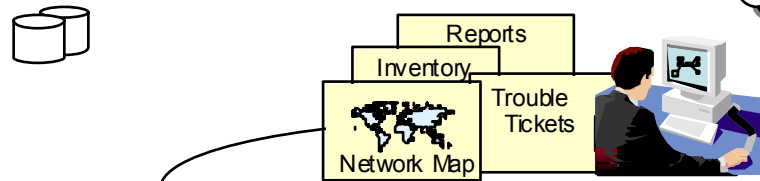
Wireless

Desktop

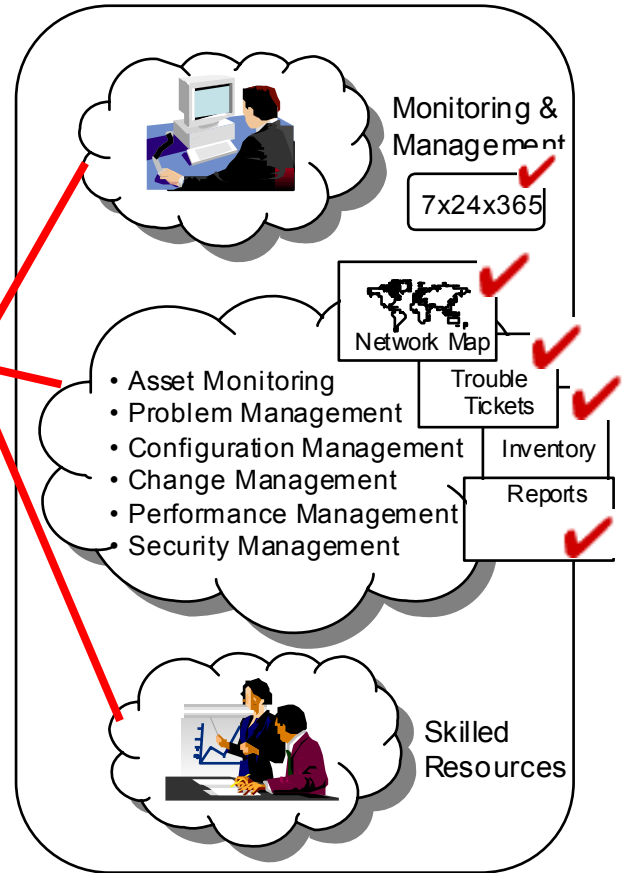
Internet

Routers

Switches

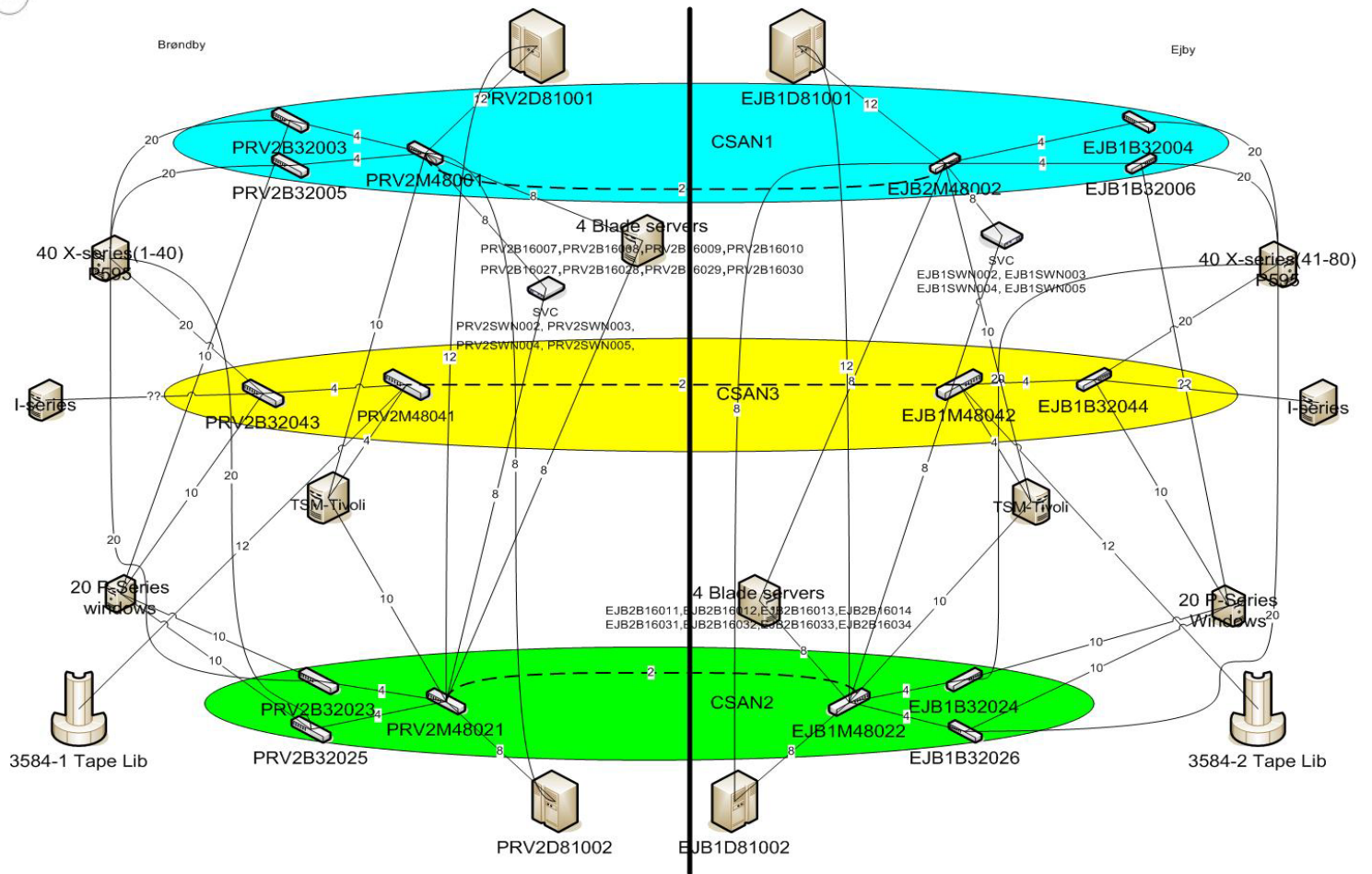


Carlsberg Portal





SAN



SAN fakta



**Baseret på IBM TotalStorage *DS8000
Teknologi**



2 x 2 DS8100, Location 1 & 2



Oprindeligt vurderet til 85 TB



Fra 2005 til 2006 vokset til > 200 TB

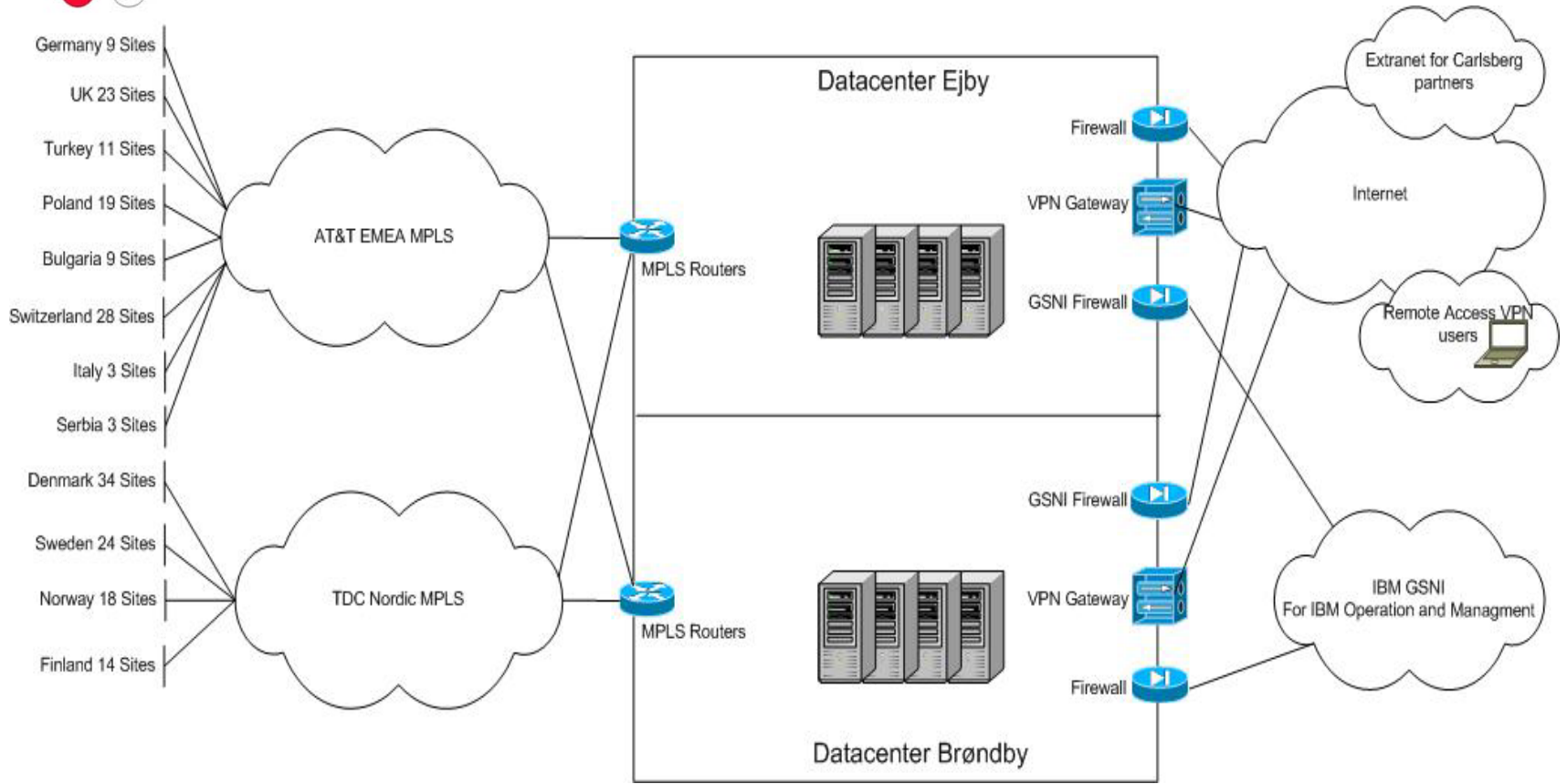


**Opbygget med hurtige og knap så hurtige
diske**



Raid 10, Flash løsning under konstruktion

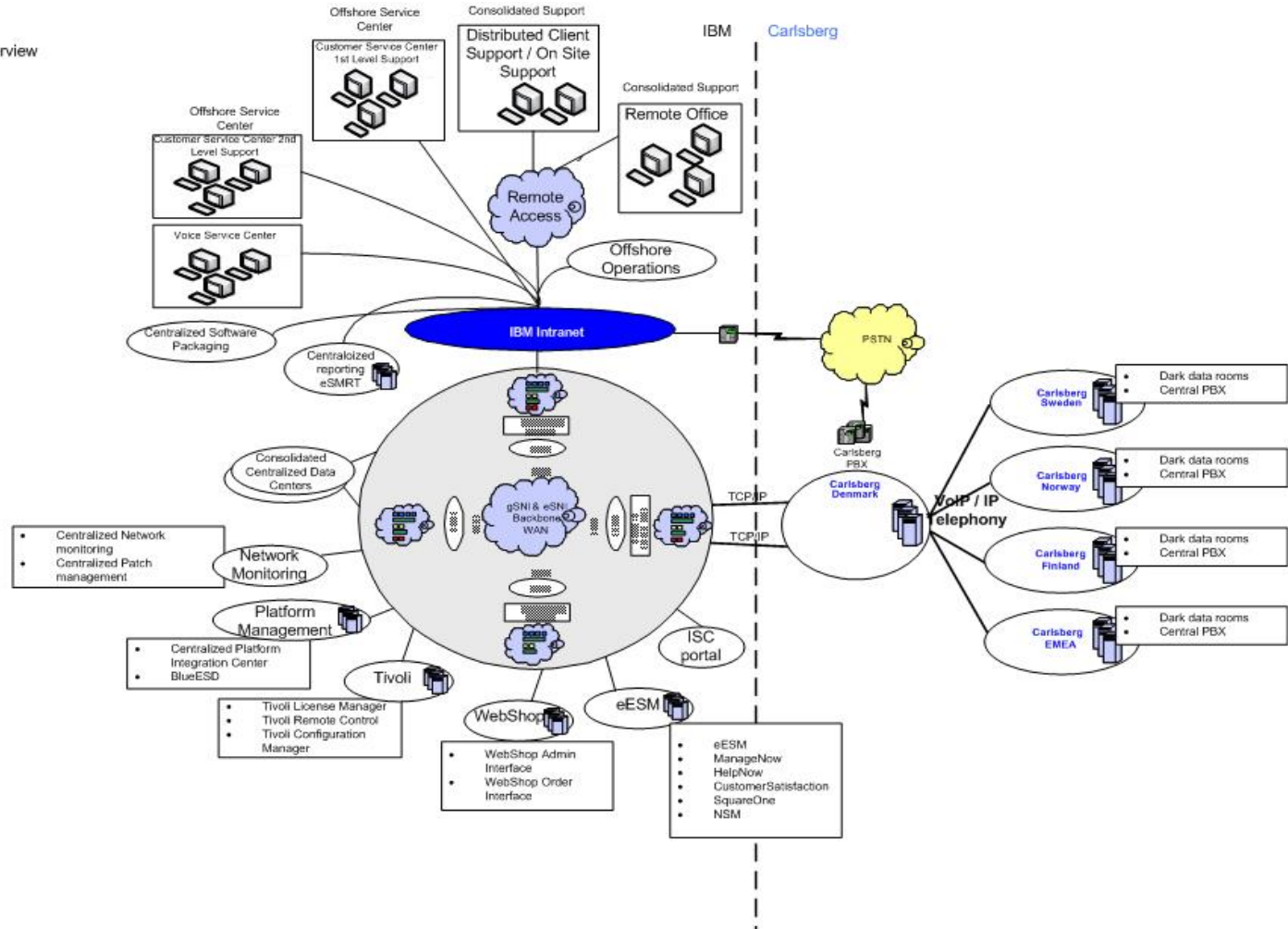
LAN / WAN



Network & Voice

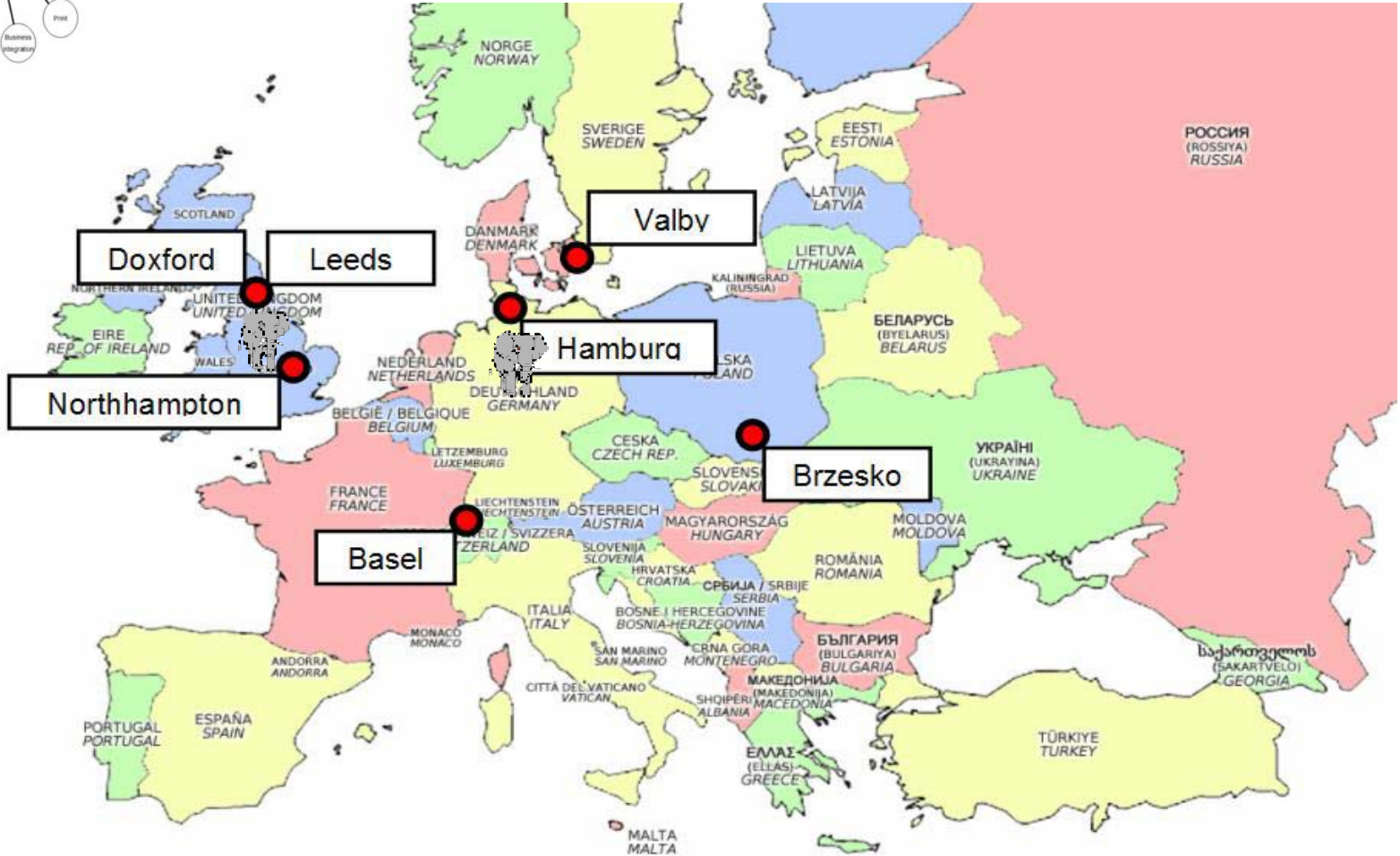


Architecture Overview Diagram











Sap server lokationer










Migreringer

-  Ca. 1-2 migrationer om ugen fra 1 Februar til 1 Oktober
-  Heterogene og homogene migreringer
-  Databaser fra 50 GB til 8 TB
-  Migrations from Valby, Tyskland, Polen, England og Svejts
-  Heterogene migrationer fra Solaris, HPUX, Windows og OS400
-  R3load(SAP) og IMIG(SAP)

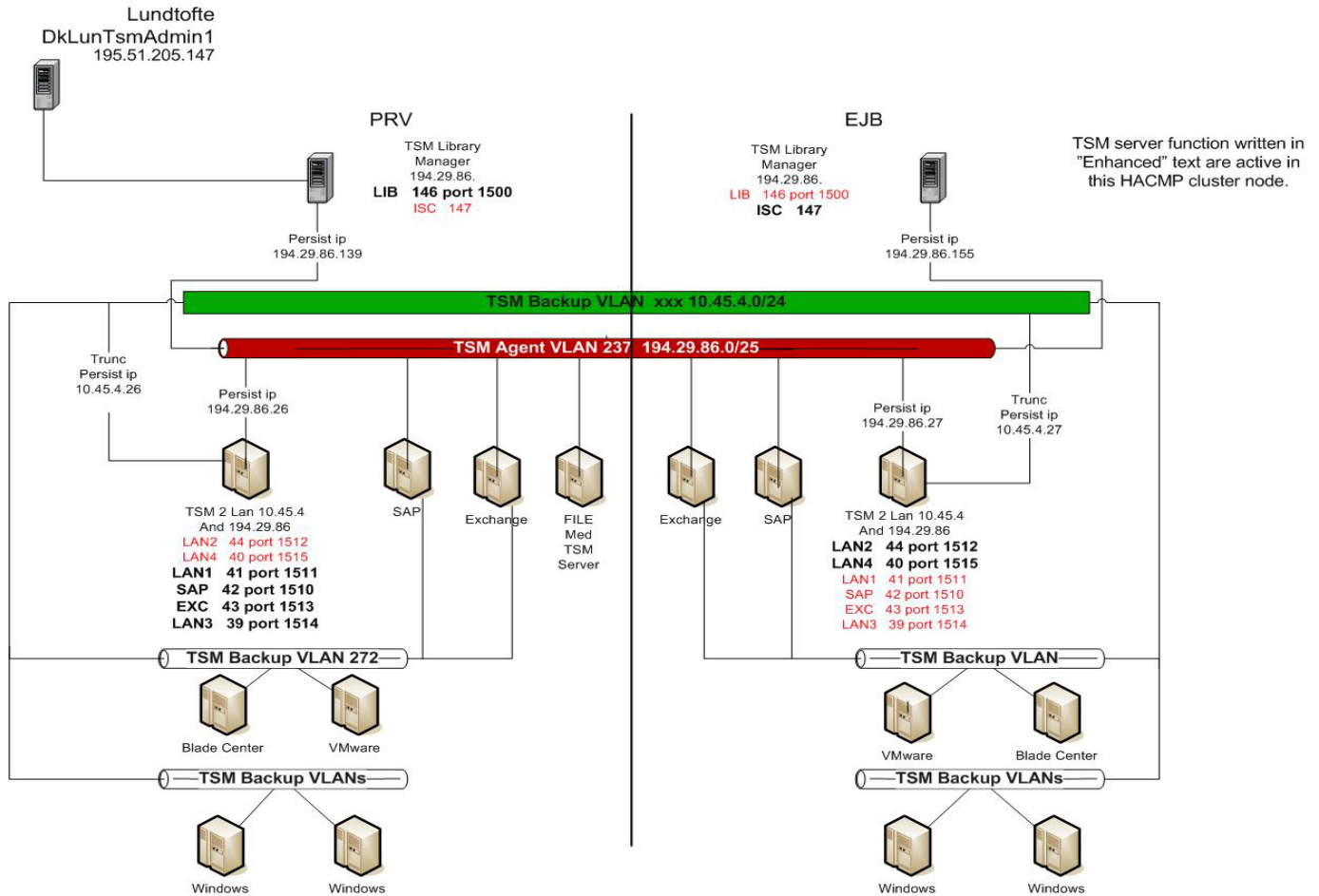


Udgangspunkter for planlægning af migreringer

-  **N x antal test migreringer**
-  **Test migrering 2 uger før endelig migrering**
-  **Udvikling og test migrering samtidig**
-  **Homogen migrering fra produktion til QA**
-  **Homogen migrering fra produktion til pre-prod**



TSM (Tivoli Storage Management) Design





Central opgave planlægning afvikling

Tivoli. TWS (Tivoli Workload Scheduler)

Tivoli. Planlagte sikkerheds kopiering af databaser og Arkivering af database logs (offline og online) via BR*Tools for Oracle og TSM (Tivoli Storage Manager)

Tivoli. Filsystem sikkerheds kopieringer

Tivoli. "Mksysb" kopieringer via NIM serververe

Tivoli. Styling og kontrol af SAP batch

Tivoli. Diverse interface aktivering, afvikling og kontrol



TWS Design

Tivoli. TWS Master location 1 (Brøndby)

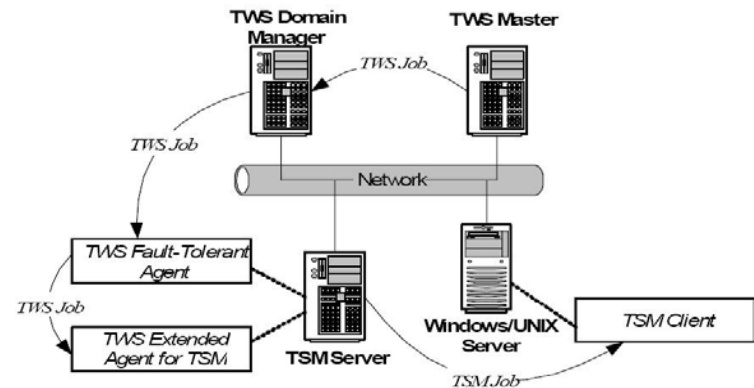
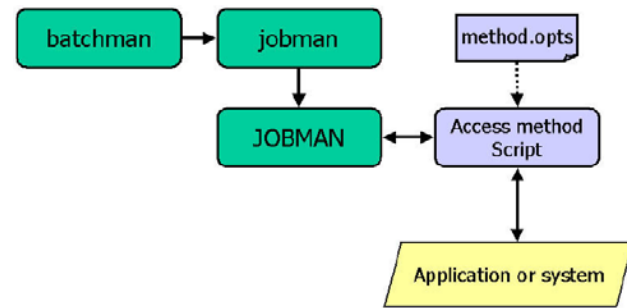
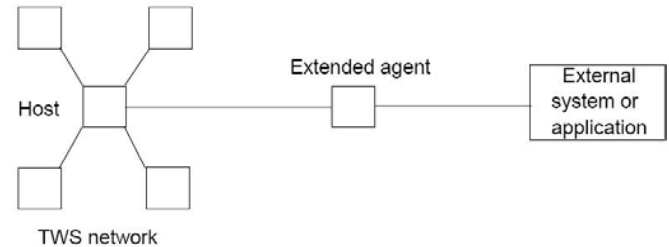
Tivoli. TWS backup Master på location 2 (Ejby)

Tivoli. TWS version 8.2.1

Tivoli. AIX Klienter

Tivoli. SAP Klienter

Tivoli. TWS masters Hostet på 2 x lpar på service servere (2x 570)





TSM Elementer



Tivoli. Produktion Backup via SAN backup

Tivoli. TSM Manager/library manager (V.5.3.4.0)

Tivoli. TSM (Tivoli Storage Manager) (V.5.3.4.0)

Tivoli. 2 x 12 Jaguar drives

Tivoli. TDP(TSM for ERP) (V.5.3.2.0)

Tivoli. Planlagt til 500TB, ... nu over 1 PB

Tivoli. TSM Server i HACMP Cluster










TME (Tivoli) Monitoring



- **Overvågning af:**
 - AIX, Storage
 - TWS
 - Central CCMS
 - Interfaces.
- **Fejl tolerant TME løsning**
- **Clustret Solution Manager**



RFS (Request for Services)

-  **Opgraderinger**
-  **Funktionelle konsolideringer**
-  **Nye SAP moduler**
-  **Nye Interfaces**
-  **Unicode**
-  **Nye Integrationer og interfaces**
-  **Temporære systemer**

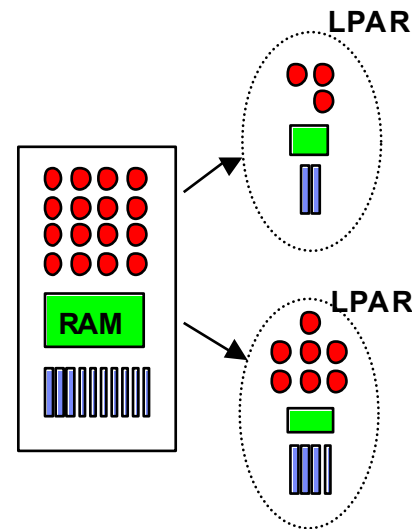
Design holder stadigt ...

Brøndby - site 1											HACMP		Ejby - site 2										
CB101LPAR													CB201LPAR										
Lpar	Saps	CPU	Mem	System	Hostname	SAN	LAN	Storage	FS	DB			Lpar	Saps	CPU	Mem	System	Hostname	SAN	LAN	Storage	FS	DB
1	3.000	2	15	VIO1 VSCSI	cb101v01	2	0	0					1	3.000	1,9	15	VIO3 VSCSI	cb201v01	2	0	0		
2	3.000	2	15	VIO2 VETH	cb101v02	0	5	0					2	3.000	1,9	15	VIO4 VETH	cb201v02	0	5	0		
3	500	0	3	Nim 1 - Primary	cb101a03	2	2	500					3	500	0,3	3	Nim 2 - Secondary	cb201a03	2	2	500		
4	500	0	3	ITS/OSS 1	cb101p04	0	1	0					4	500	0,3	3	ITS/OSS 2	cb201p04	0	1	0		
5	1.000	1	8	PreProd Nordic R3+HR	cb101s05	4	2	5415	100	4429	P1	S1	5	1.000	1,0	8	PreProd Nordic APO	cb201s05	4	2	0		
6	500	0	3	Solution Manager 1	cb101p06	2	2	0			S2	P2	6	500	0,3	3	Solution Manager 2	cb201p06	2	2	0		
7	41.550	26	210	Nordic R/3 + HR PROD	cb101p07	4	2	8577	40	2707	P3	S3	7	41.550	26,3	210	Nordic R/3 + HR QA/PROD	cb201p07	4	2	3268	20	2707
8	11.063	7	56	Nordic APO/LC PROD	cb101p08	4	2	304	20	110	P4	S4	8	11.063	7,0	56	Nordic APO/LC QA/PROD	cb201p08	4	2	152	20	110
9	10.552	7	53	Switzerland R/3+HR QA/PROD	cb101p09	4	2	1474	20	1212	S5	P5	9	10.552	6,7	53	Switzerland R/3+HR PROD	cb201p09	4	2	2989	40	1212
10	1.798	1	9	Polan R/3+HR QA/PROD	cb101p10	4	2	378	20	298	S6	P6	10	1.798	1,1	9	Polan R/3+HR PROD	cb201p10	4	2	795	40	298
11	1.150	1	6	Polan CRM QA/PROD	cb101p11	4	2	23	10	11	S7	P7	11	1.150	0,7	6	Polan CRM PROD	cb201p11	4	2	108	40	11
12	500	0	3	Switzerland BW QA	cb101p12	4	2	10	10		P	P	12	1.400	0,9	7	Switzerland BW PROD	cb201p12	4	2	82	40	1
13	500	0	3	Nordic BW QA	cb101p13	4	2	1155	10	954	P	P	13	4.518	2,9	23	Nordic BW PROD	cb201p13	4	2	2330	20	954
14	500	0	3	Polan BW QA	cb101p14	4	2	32	10	18	P	P	14	1.150	0,7	6	Polan BW PROD	cb201p14	4	2	83	20	18
15	500	0	3	Polan R/3+HR DEV	cb101s15	0	0	104	20	70			15	500	0,3	3	Nordic R/3 + HR DEV	cb201s15	0	0	182	20	135
16	500	0	3	Switzerland R/3+HR DEV	cb101s16	0	0	102	20	68			16	500	0,3	3	Nordic CRM DEV	cb201s16	0	0	59	10	41
17	500	0	3	Polan BW DEV	cb101s17	0	0	32	10	18			17	500	0,3	3	Nordic BW DEV	cb201s17	0	0	77	10	56
18	500	0	3	Switzerland BW DEV	cb101s18	0	0	11	10	1			18	500	0,3	3	Nordic APO/LC DEV	cb201s18	0	0	99	10	74
19	500	0	3	Polan CRM DEV	cb101s19	0	0	20	10	8			19	500	0,3	3	Nordic Sandbox	cb201s19	0	0			
20	500	0	3	Polan Sandbox	cb101s20	0	0						20	500	0,3	3	Switzerland Sandbox	cb201s20	0	0			
CB102LPAR													CB202LPAR										
Lpar	Saps	CPU	Mem	System	Hostname	SAN	LAN	Storage	FS	DB			Lpar	Saps	CPU	Mem	System	Hostname	SAN	LAN	Storage	FS	DB
1	3.000	2	15	VIO5 VSCSI	cb102v01	2	0	0					1	3.000	1,9	15	VIO7 VSCSI	cb202v01	2	0	0		
2	3.000	2	15	VIO6 VETH	cb102v02	0	5	0					2	3.000	1,9	15	VIO8 VETH	cb202v02	0	5	0		
3	500	0	3	ITS/OSS 3	cb102p03	0	1	0					3	500	0,3	3	ITS/OSS 4	cb202p03	0	1	0		
4	1.000	1	8	PreProd Nordic CRM	cb102s04	4	2	0					4	1.000	1,0	8	PreProd BW	cb202s04	4	2	0		
5	10.936	7	55	UK R/3 + HR PROD	cb102p05	4	2	5734	40	2356	P8	S8	5	10.936	6,9	55	UK R/3 + HR QA/PROD	cb202p05	4	2	2780	20	2300
6	1.416	1	7	Nordic CB R/3 PROD	cb102p06	4	2	160	20	50	P9	S9	6	1.416	0,9	7	Nordic CB R/3 QA/PROD	cb202p06	4	2	70	10	50
7	12.335	8	62	Germany R/3+EP PROD	cb102p07	4	2	1448	40	570	P10	S10	7	12.335	7,8	62	Germany R/3+EP QA/PROD	cb202p07	4	2	704	20	570
8	49.140	31	249	Nordic CRM QA/PROD	cb102p08	4	2	800	10	658	S12	P12	8	49.140	31,1	249	Nordic CRM PROD	cb202p08	4	2	1619	20	858
9	886	1	4	Nordic CB CFM PROD	cb102p09	4	2	88	20	20	P13	P13	9	866	0,5	4	Nordic CB CFM QA/PROD	cb202p09	4	2	34	10	20
10	4.936	3	25	UK BW PROD	cb102p10	4	2	554	20	214	P	P	10	500	0,3	3	UK BW QA	cb202p10	4	2	267	10	214
11	2.959	2	15	Germany BW PROD	cb102p11	4	2	596	40	215	P	P	11	500	0,3	3	Germany BW QA	cb202p11	4	2	268	10	215
12	500	0	3	Nordic CB BW QA	cb102p12	4	2	106	10	80	P	P	12	944	0,6	5	Nordic CB BW PROD	cb202p12	4	2	232	20	80
13	500	0	3	UK R/3 + HR DEV	cb102s13	0	0	476	20	380			13	500	0,3	3	Nordic CB R/3 DEV	cb202s13	0	0	40	10	25
14	500	0	3	UK BW DEV	cb102s14	0	0	34	10	20			14	500	0,3	3	Nordic CB BW DEV	cb202s14	0	0	34	10	20
15	500	0	3	Germany R/3+EP DEV	cb102s15	0	0	624	20	503			15	500	0,3	3	Nordic CB CFM DEV	cb202s15	0	0	34	10	20
16	500	0	3	Germany BW DEV	cb102s16	0	0	51	10	34			16	500	0,3	3	Nordic CB Sandbox	cb202s16	0	0			
17	500	0	3	UK Sandbox	cb102s17	0	0						17	500	0,3	3	Germany Sandbox	cb202s17	0	0			
18	500	0	3	UK XI	cb102s18	4	4				P	P	18	500	0,3	3	UK XI QA/PROD	cb202p18	4	4			
19	500	#REF!	3	UK ERP 2004 DEV	cb102s19								19	500	0,3	3	UK ERP 2004 QA	cb202s19					
20	500	#REF!		UK XI DEV	cb102s20																		

Virtuelle elementer i løsningen

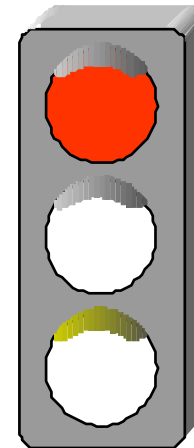
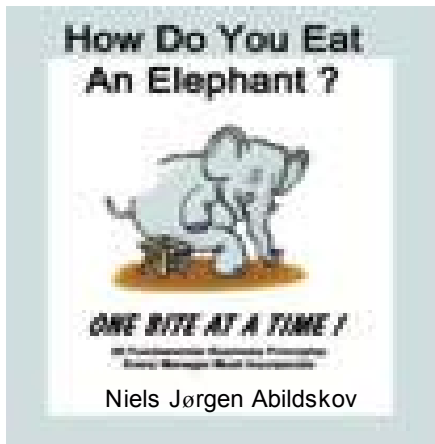
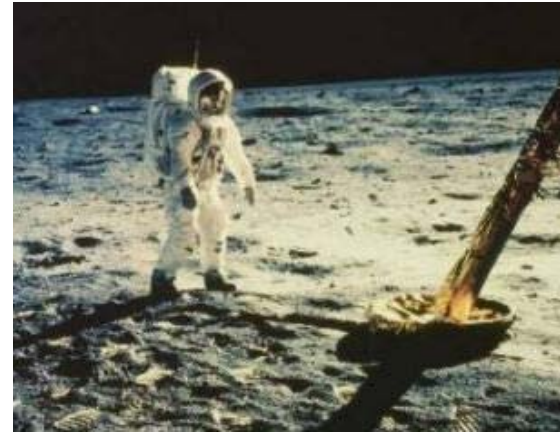
- ⊕ Virtual Ethernet
- ⊕ Delte Ethernet Adapter
- ⊕ Virtual SCSI Server
- ⊕ Micro-Partitioning teknologi
 - ⊕ Uncaped med vægtning
- ⊕ WLM (Work Load Manager)
- ⊕ PLM (Partition Load Manager) under overvejelse

- ↻ CPU
- ↻ Memory
- ↻ VIO

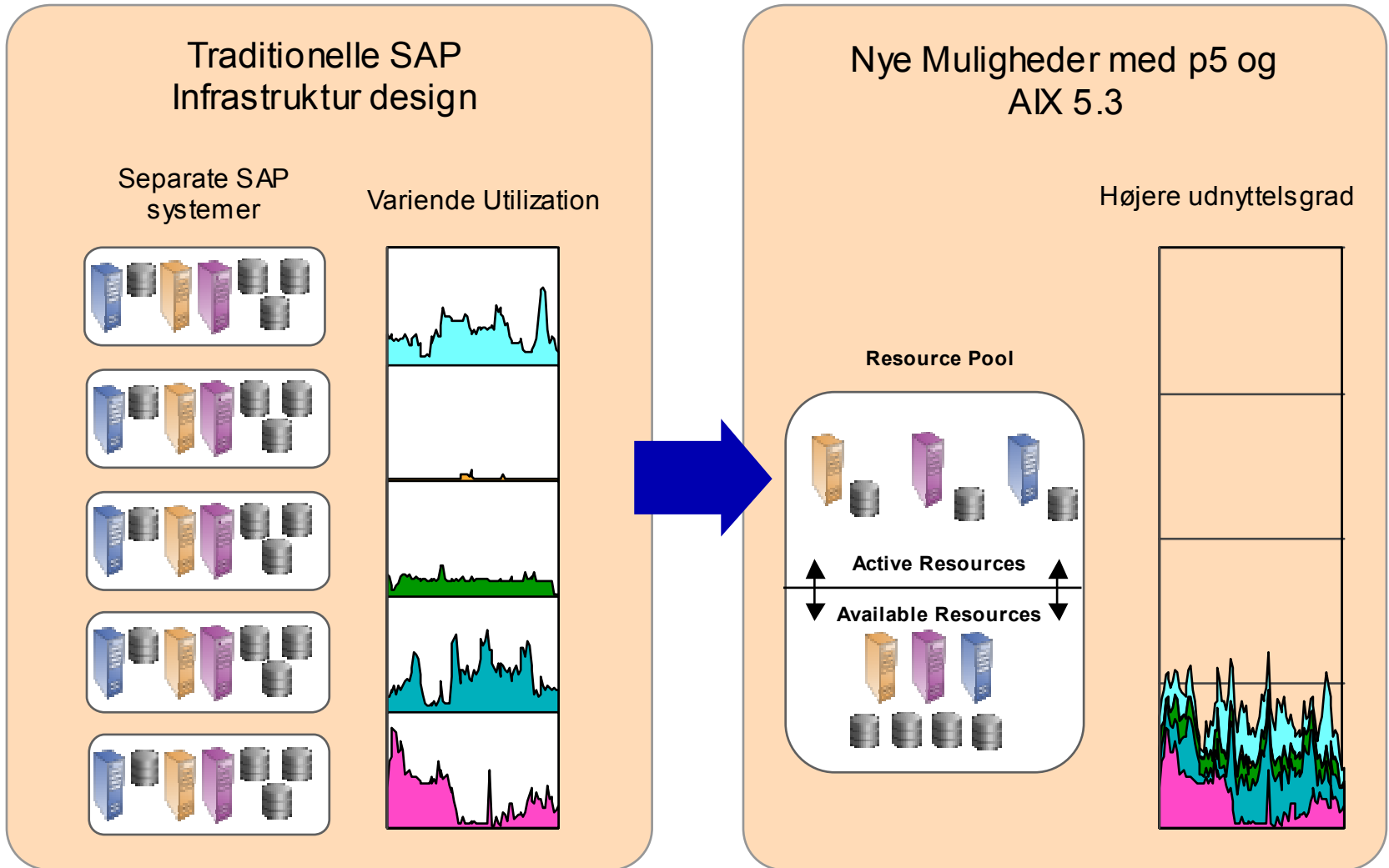


- ◆ Sap instans
- ◆ DB server
- ◆ APP server's

... Kun første step



Den virtuelle SAP Vision



Nye muligheder

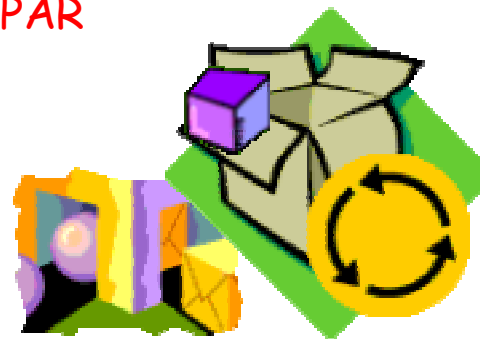
Ny måde at tænke utilization

- Ikke mere statiske ressourcer
- + Men dynamik over hele linien



dLPAR

Adaptive Computing

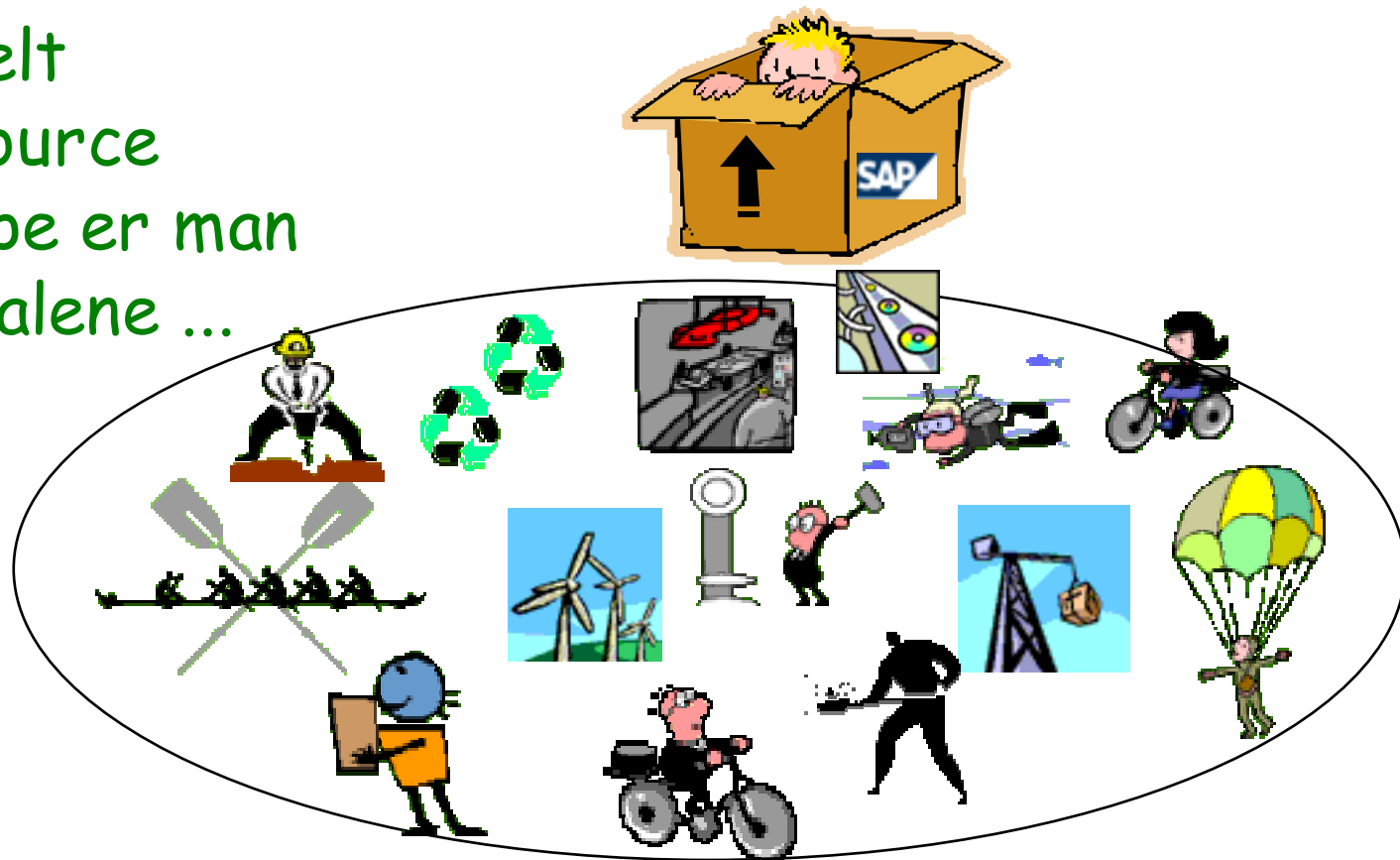


Shared Pool

Processor

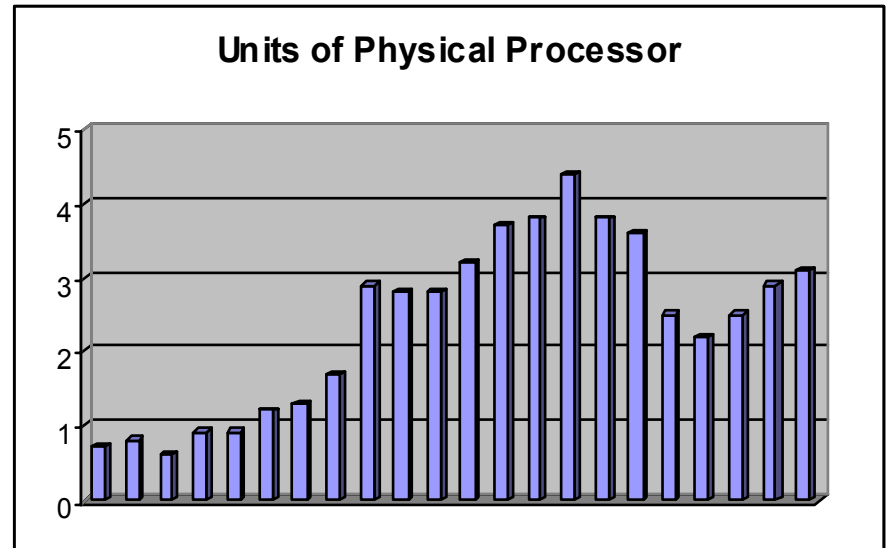
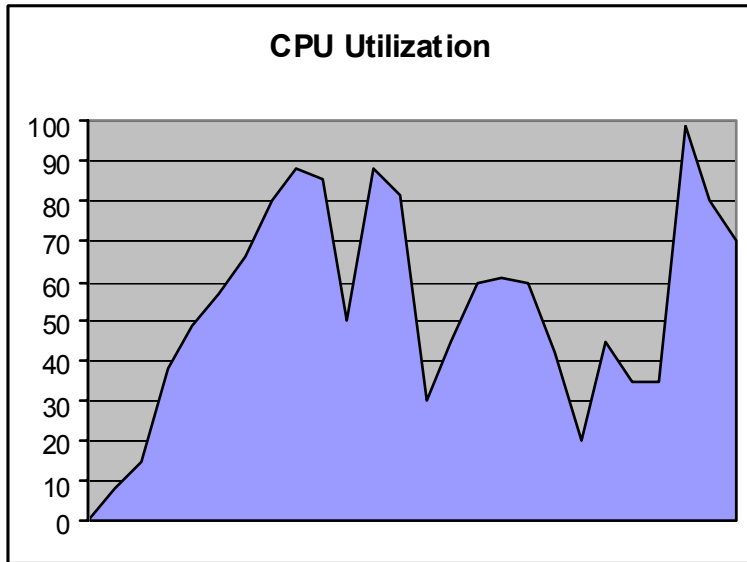
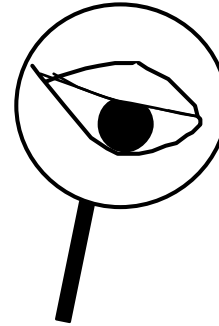
... Husk

I en delt
 ressource
 gruppe er man
 ikke alene ...

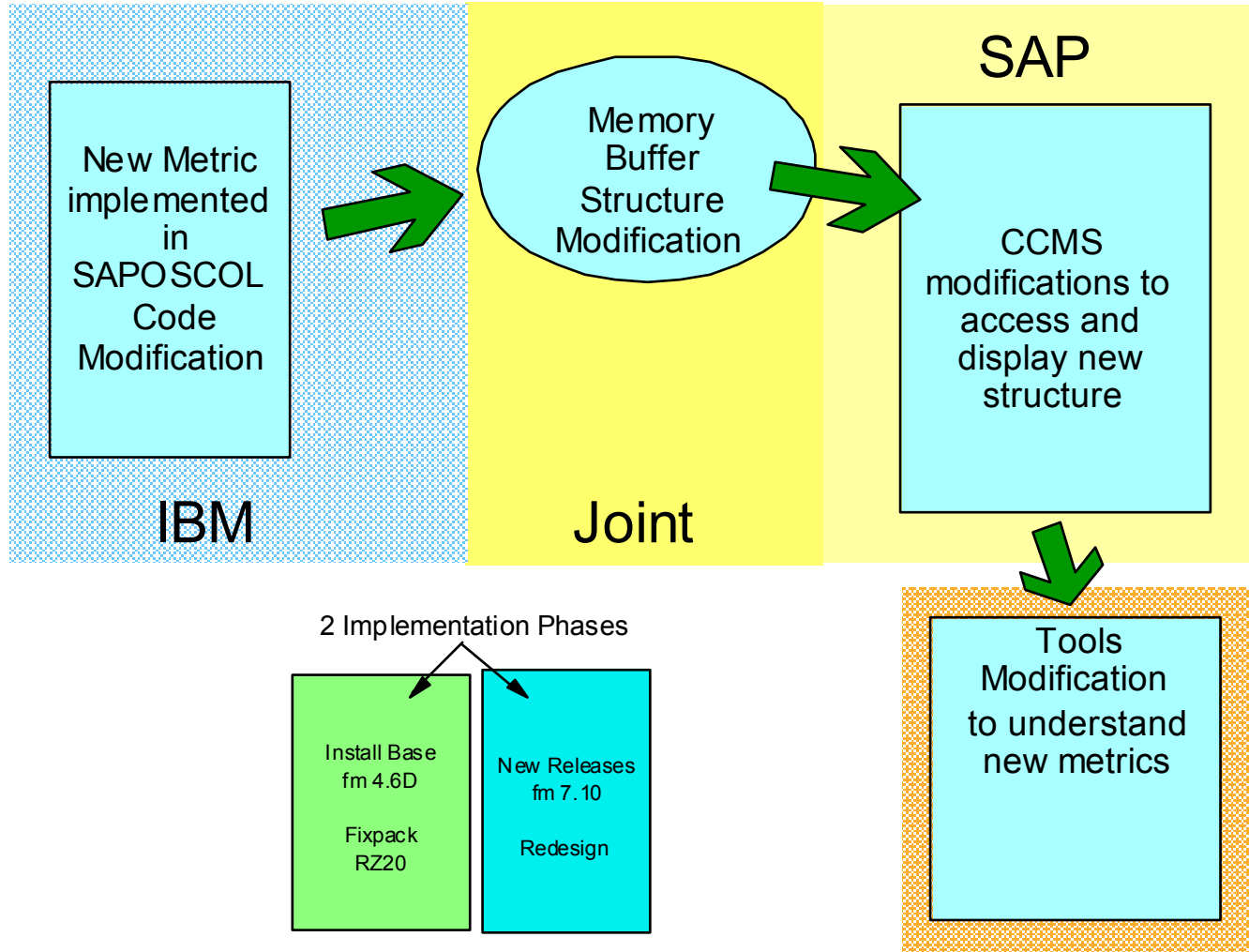


Ny måde anskue ydeevne og udnyttelsesgrad

- Ikke % CPU kapacitet
- +Men enheder af fysiske processorer



Lys for enden ...



Hvordan det kunne komme til at se ud ... (RZ20)

SAP CCMS Monitor Templates (Operating System) - Maintenance function

SAP CCMS Monitor Templates (Operating System) - Maintenance function

View: Current system status (17.01.2006 , 15:26:40)

Node display off

- Operating System
 - is18d4_JRN_00
 - Filesystems
 - CPU

<input type="checkbox"/> Partition	<input checked="" type="checkbox"/>	SPLPAR-Uncapped	Green	17.01.2006	15:26:40
<input type="checkbox"/> Virtual CPUs	<input checked="" type="checkbox"/>	20	Green	17.01.2006	15:26:44
<input type="checkbox"/> SMT Threads	<input checked="" type="checkbox"/>	2	Green	17.01.2006	15:26:40
<input type="checkbox"/> Phys Cpus	<input checked="" type="checkbox"/>	4	Green	17.01.2006	15:26:44
<input type="checkbox"/> Phys Consume	<input checked="" type="checkbox"/>	2.33	Green	17.01.2006	15:26:40
<input type="checkbox"/> Phys Idle	<input checked="" type="checkbox"/>	1.17	Green	17.01.2006	15:26:44
<input type="checkbox"/> Entitlement	<input checked="" type="checkbox"/>	2.00	Green	17.01.2006	15:26:40
<input type="checkbox"/> %EntConsumed	<input checked="" type="checkbox"/>	116	Green	17.01.2006	15:26:44
<input type="checkbox"/> CPU_Utilization	<input checked="" type="checkbox"/>	2 %	Green	17.01.2006	15:26:40
<input type="checkbox"/> 5minLoadAverage	<input checked="" type="checkbox"/>	0 QL	Green	17.01.2006	15:26:44
<input type="checkbox"/> Idle	<input checked="" type="checkbox"/>	98 %	Green	17.01.2006	15:26:40
 - Paging
 - Swap_Space
 - OS_Collector
 - Lan

... Set i bakspejlet

- 📌 Efter 9 måneder ingen ej planlagte nedbrud
- 📌 Planlægning, Systematik, "Change management" og Standardisering er ekstremt vigtigt
- 📌 Vigtigt at have kontrol over SAN og LAN
- 📌 AIX 5.3 meget stabil
- 📌 WLM fungerer
- 📌 VIO fungerer
- 📌 P5, AIX 5.3 og SAP kombinationen lever op til forventningerne.

Det kører endnu ...



Konkurrence: Hvad er SAPSID på Carlsbergs R/3 Prod? Og hvorfor?



Tak for
opmærksomheden
Spørgsmål ?



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