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The on demand Culture – 40 Years Mainframe and Linux

The World of "on demand"

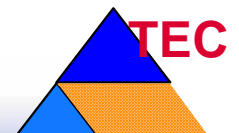
- What is an on demand business and why should I become one?
- What kind of operating environment does on demand business require, and how do I build one?
- Can on demand business redefine the way I buy and manage computing?

What is an "on demand business"?

An enterprise whose business processes -- integrated end-to-end across the company and with key partners, suppliers and customers -- can respond with speed to any customer demand, market opportunity or external threat.

Business on demand

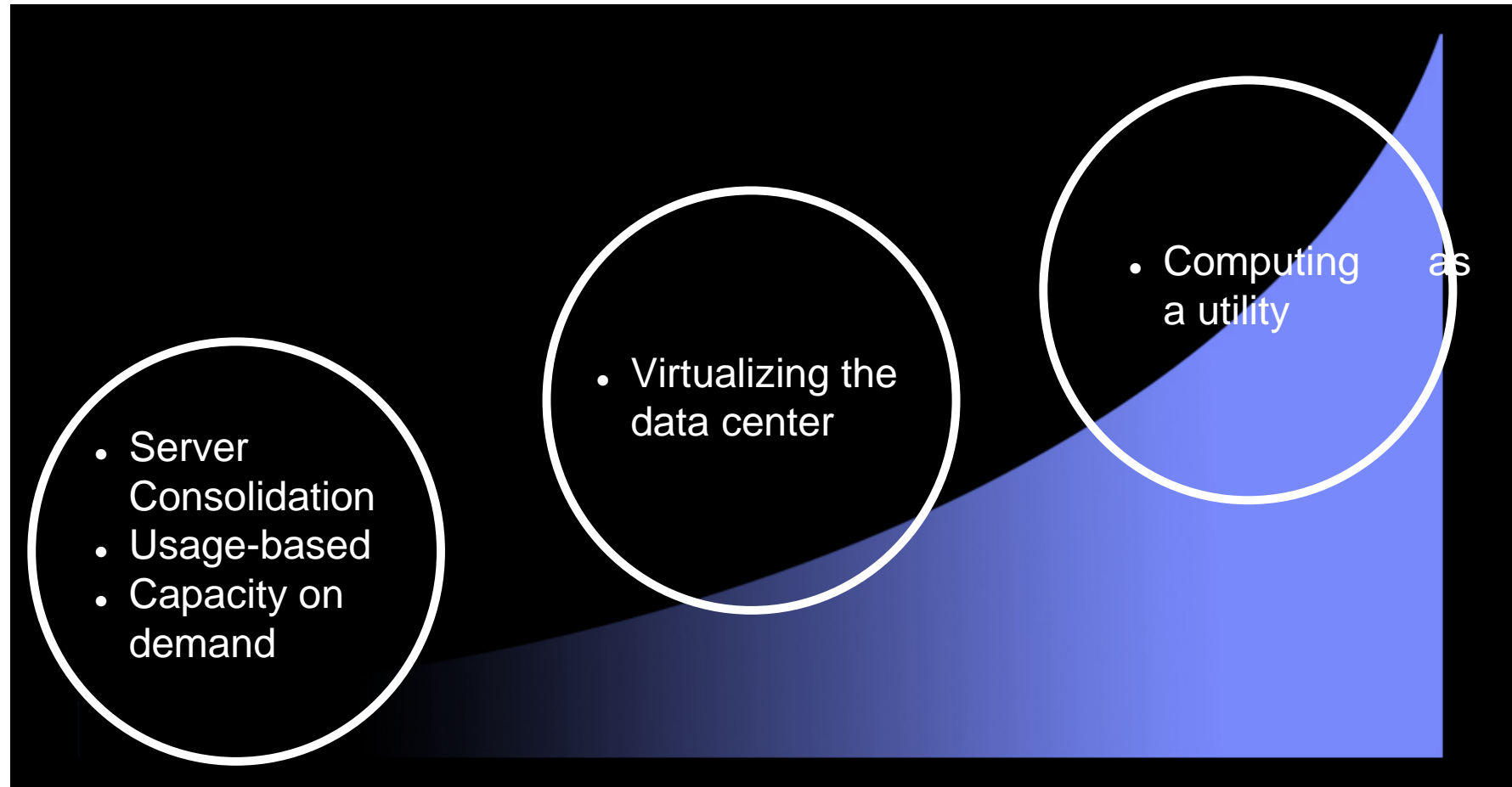
Business Attributes	Operating Environment Requirements
Responsive in real time	Integrated
Variable cost structures	Open
Resilience around the world, around the clock	Virtualized
Focus on core competencies / what's differentiating	Autonomic



Can On Demand Business redefine the way I buy and manage Computing?

On demand operating environment offers more flexibility, variability and economically attractive choices for buying and managing computing.

Flexibility and Choice



7 April 1964

IBM announces System 360

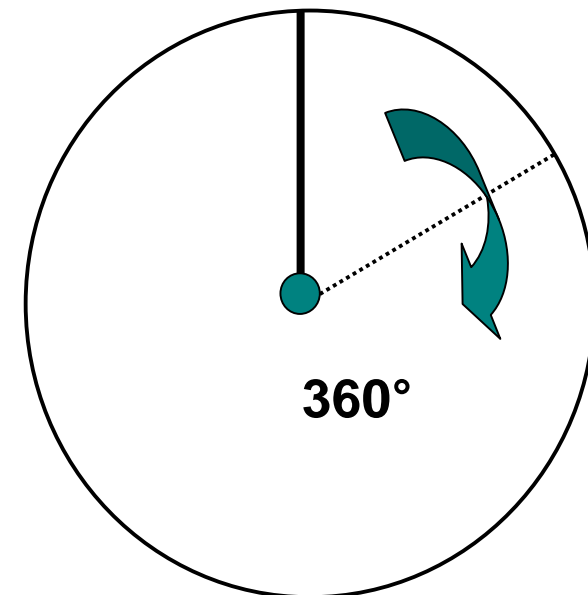
Chief architects:

G. Amdahl, G.A. Blaauw, F.P. Brooks

Development Executive:

B.O. Evans

S 360



A Platform for all requirements

commercial
data processing



scientific
computing

application

batch



interaktive

processing

small/slowly



large/fast

performance

competitive



maximum capacity

economic efficiency

... and for the future

After 40 years as vital as ever before!

Quality of an architecture (G.A. Blaauw)

- **architecture**: The functional appearance of a system to the user, its phenomenology
- **implementation**: The logical structure which performs the architecture
- **realization**: The physical structure which embodies the implementation.

„ A good architecture is consistent!“

- **orthogonal** - „Independent functions specified separately“
- **proper**
 - „No unessential functions introduced“
 - „No competing ways to specify a function“
 - „Implementation dependent functions, limitations and characteristics not visible at the architecture line“
- **general**
 - „open-ended“
 - „complete“

System 360 Model 20



System 370 Model 9370 - Family

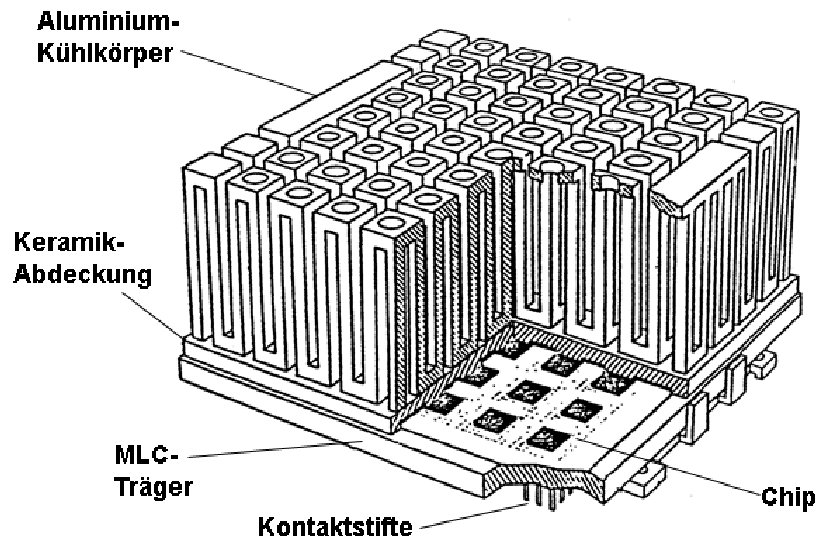


IBM @server For the next generation of e-business.

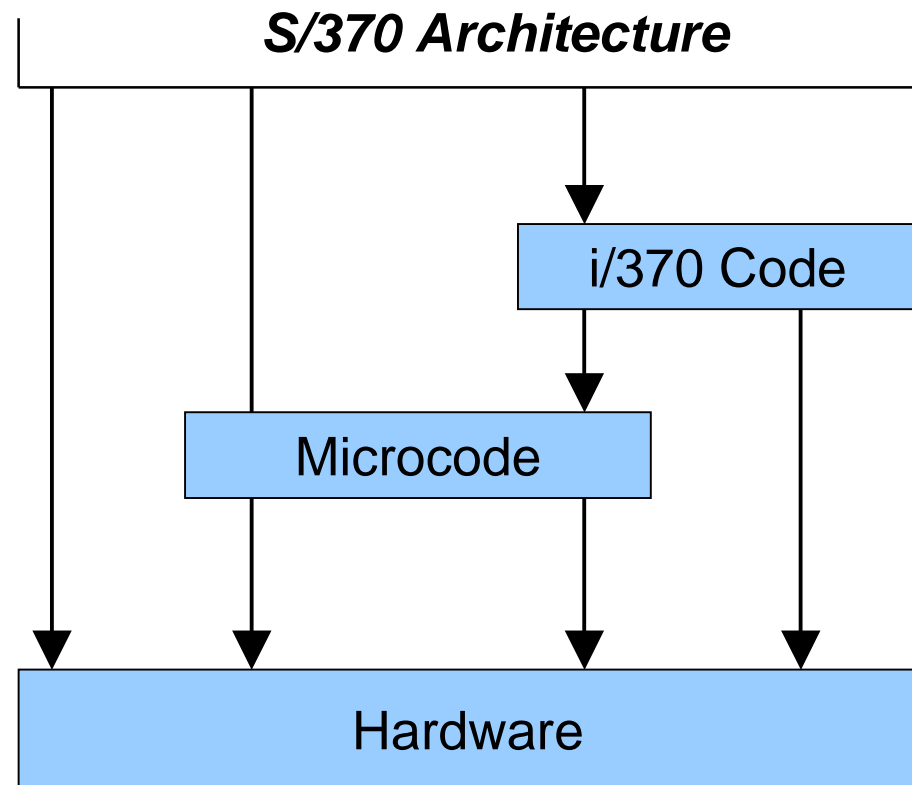


Key Innovations

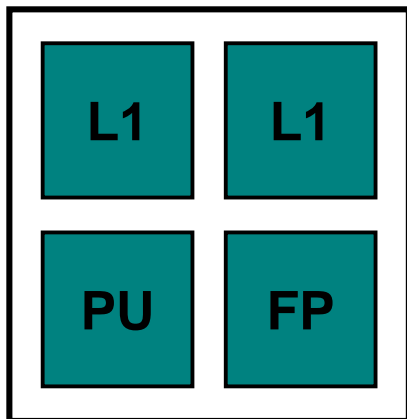
Air-cooled TCM



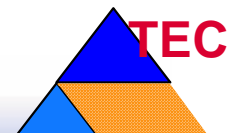
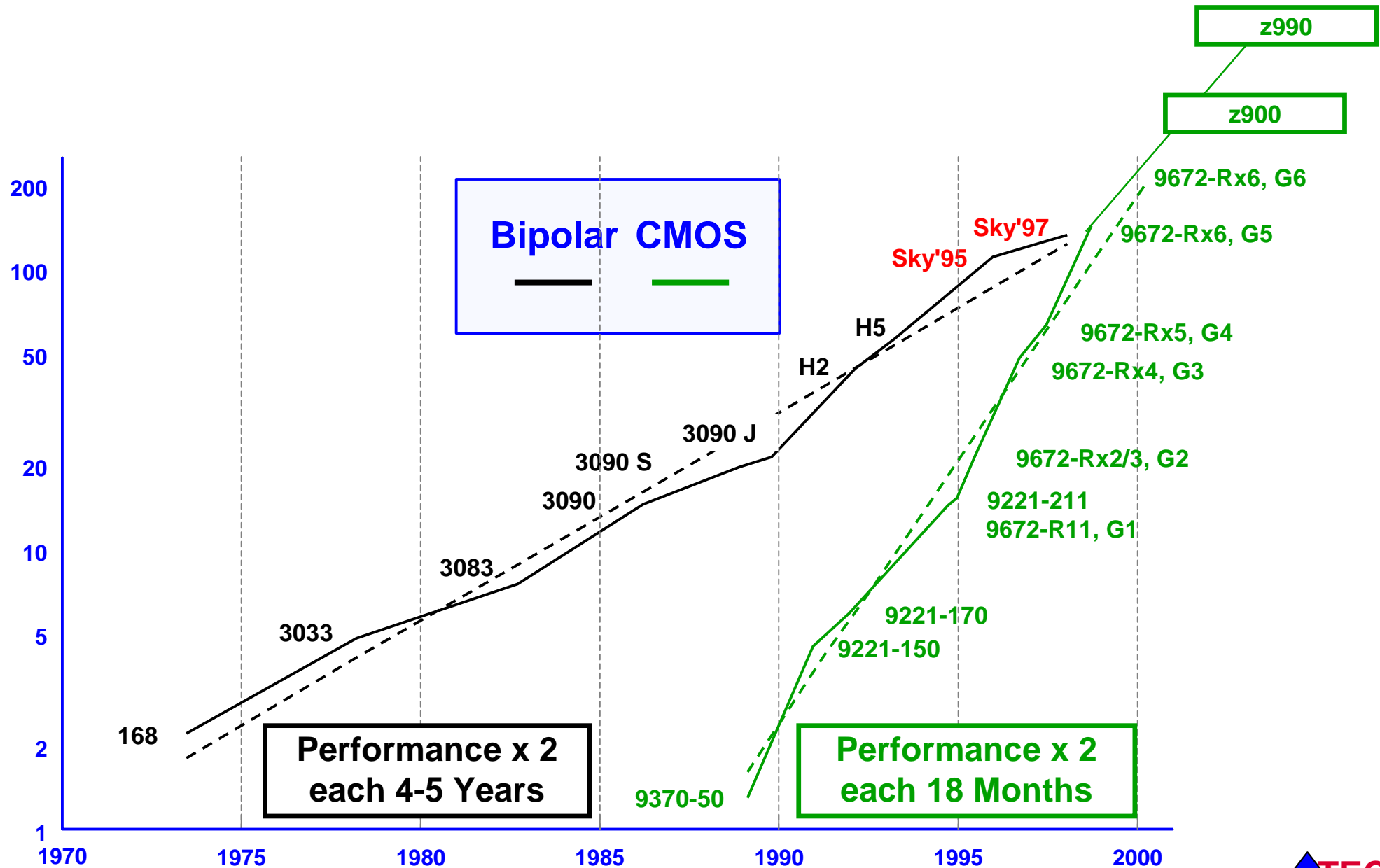
Microcode Structure



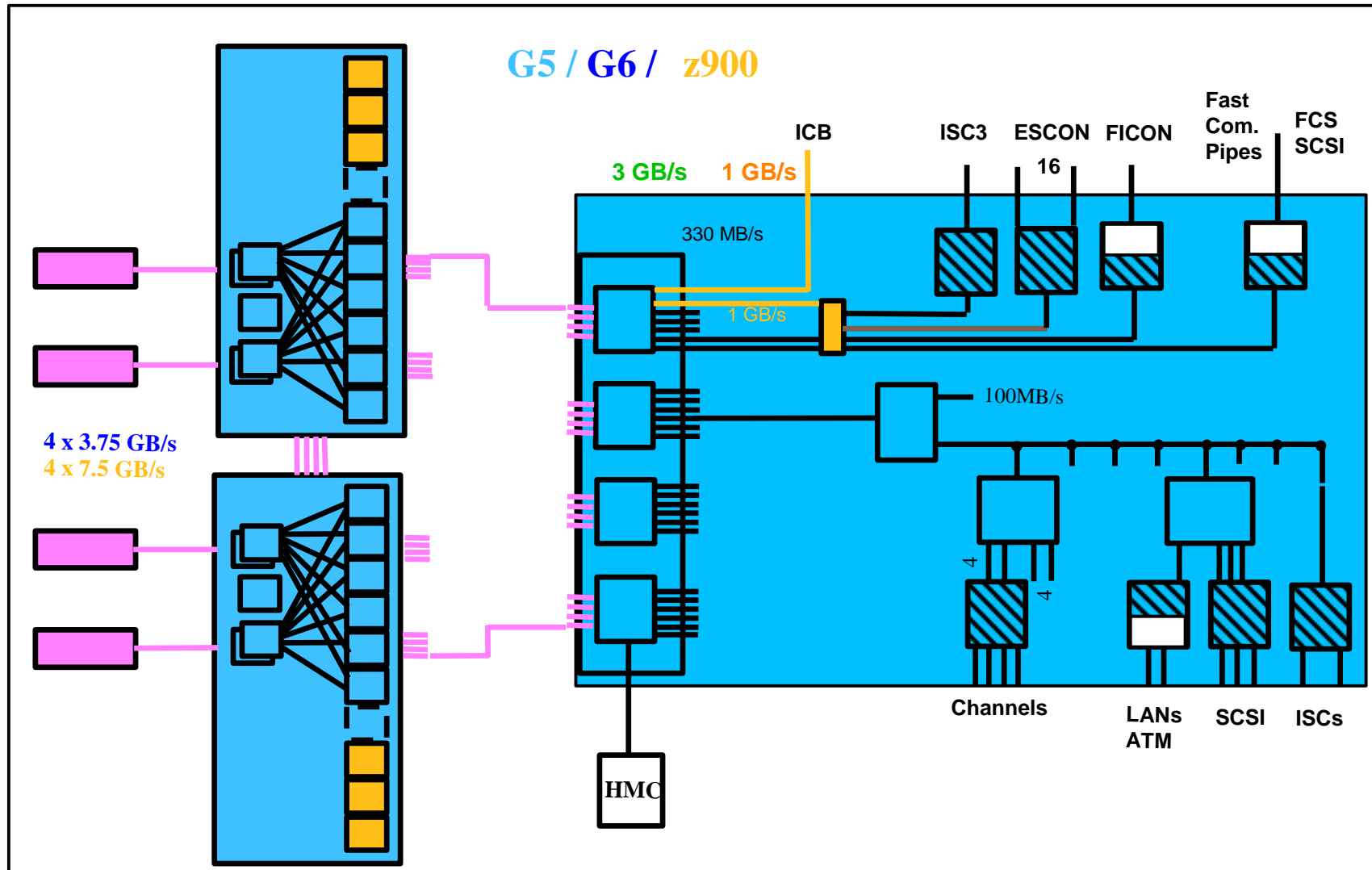
Capitol Chip Set



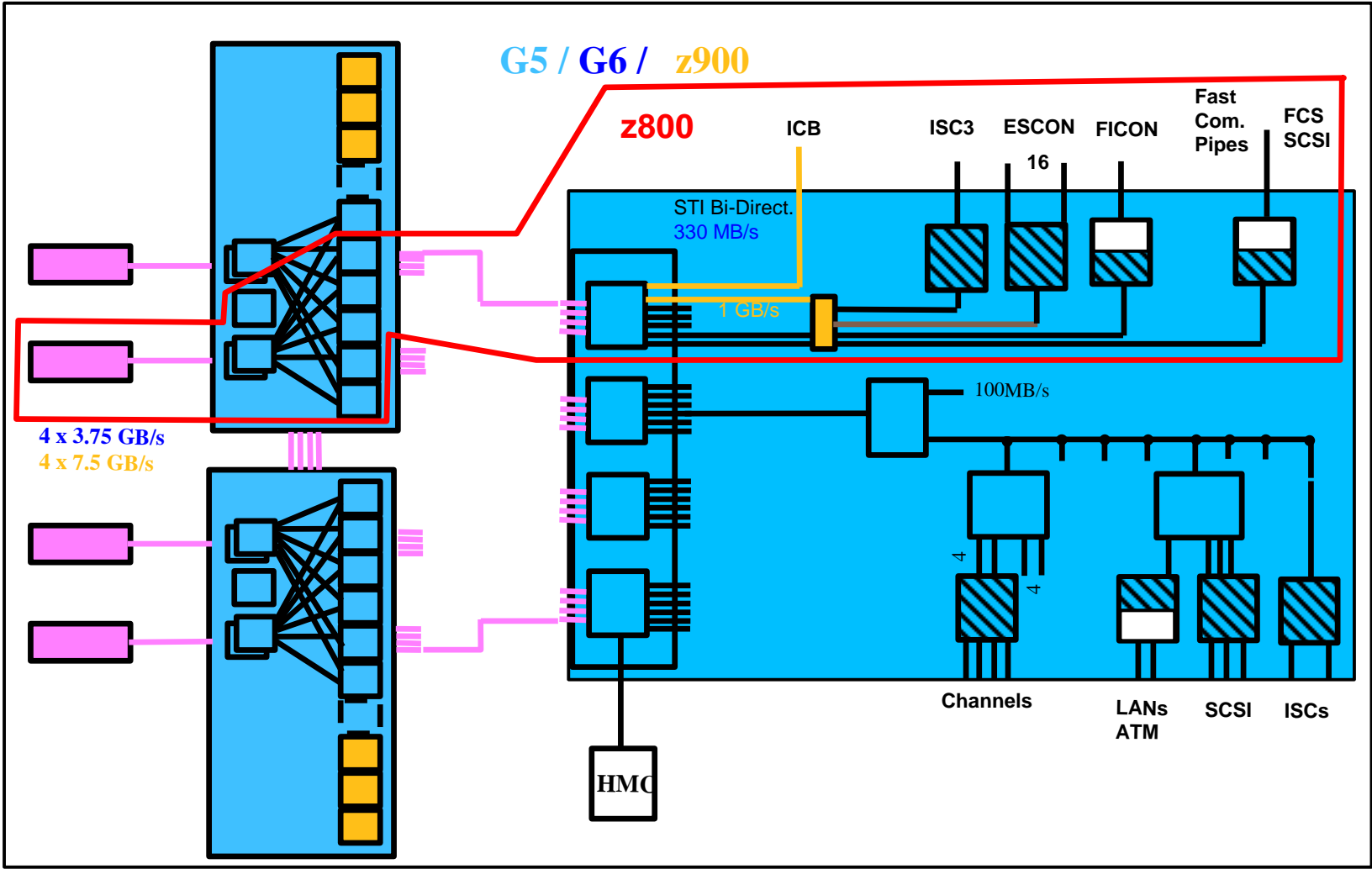
Bipolar to CMOS



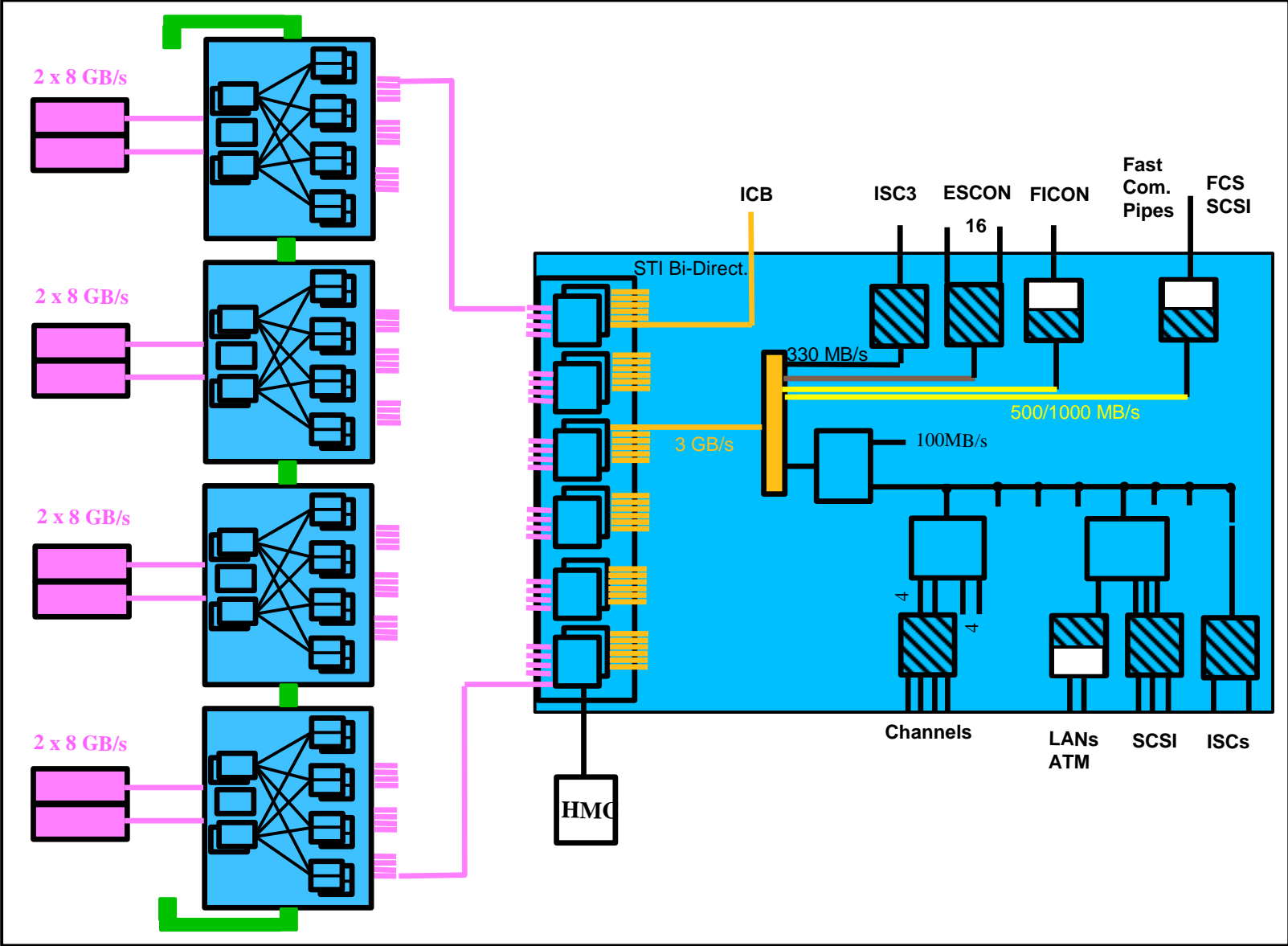
S/390 Platform Structure Evolution



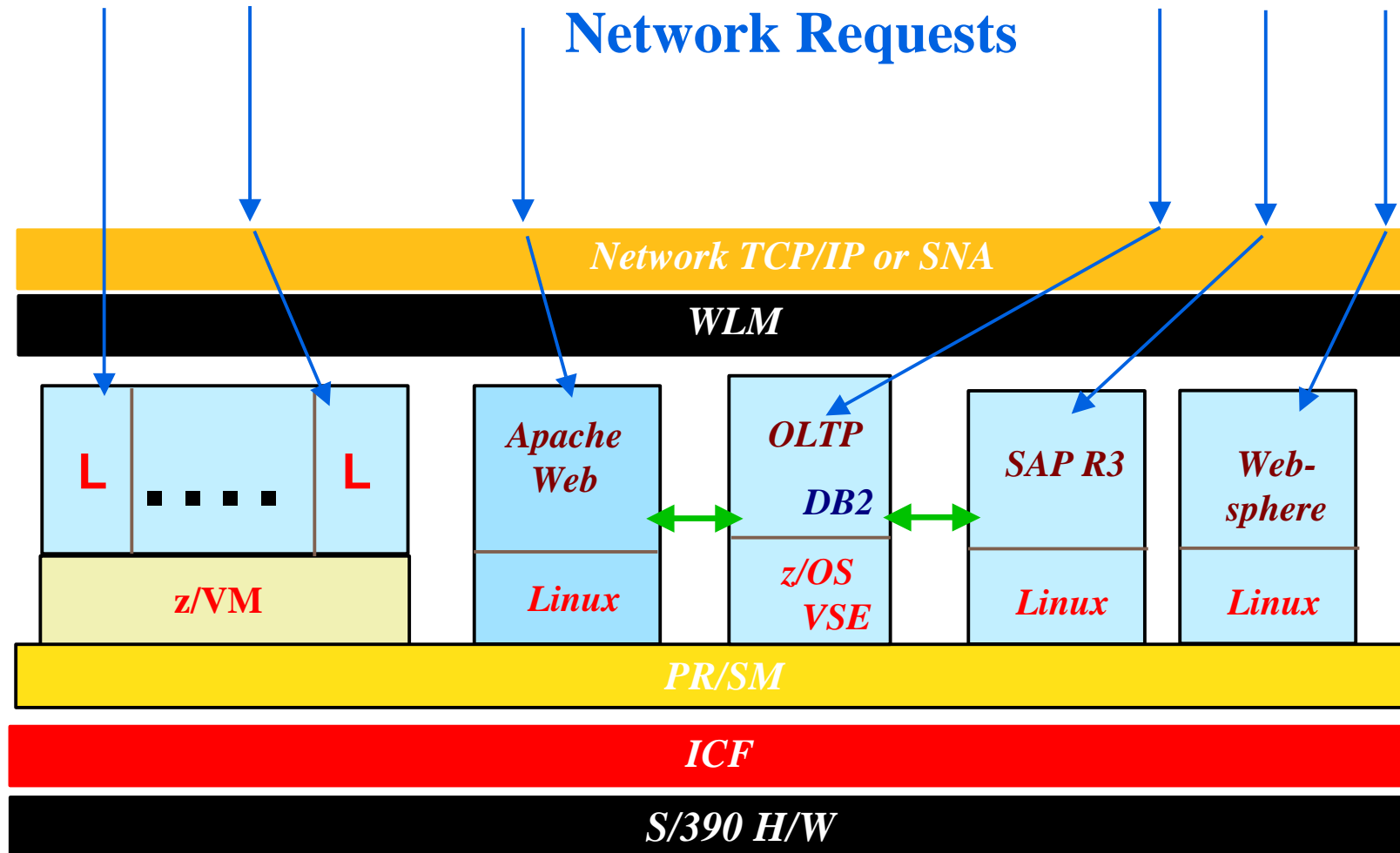
z800 as derivative of z900



z990 evolved from z900



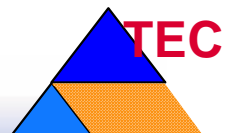
Heterogeneous virtual system consolidation on zSeries platform



S/390 Reliability - Availability - Serviceability

- **Guarantee Data Integrity**
 - 100% error detection
 - ECC for Memory Caches + Busses
 - Memory Key Protection
- **Provide Continuous Availability**
 - Hardware Redundancy
 - Parallel Sysplex
 - Concurrent Repair + Upgrade
- **Minimize Customer Impact**
 - Deferred Repair
 - Degraded Operation
- **Eliminate Customer Involvement**
 - Dynamic Spare Processor Activation
 - Storage Reconfiguration
 - I/O Reconfiguration

➔ **Acknowledged Industry RAS Leadership**



Design Principles



➤ Linux/390 remains Linux

- ❖ The Linux structure, development rules and coding style remain unchanged

➤ S/390 remains S/390

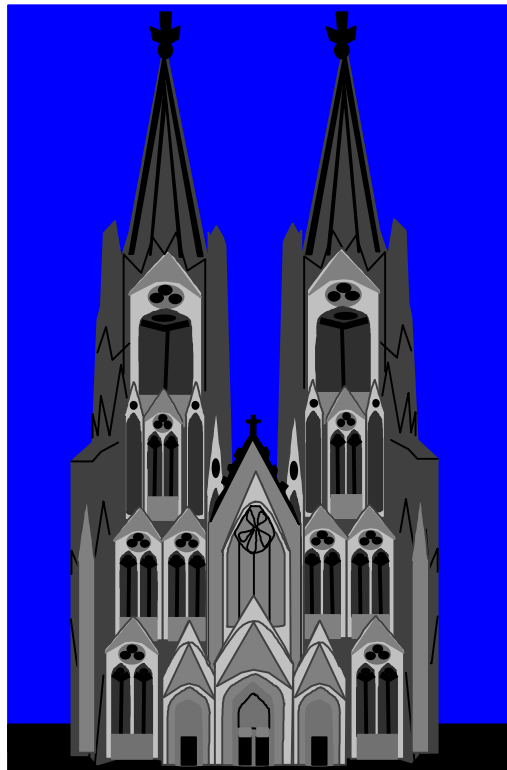
- ❖ The mere S/390 hardware architecture is sufficient for implementing Linux

Do it the LINUX way

Established development

Process:

➔ Cathedral Style

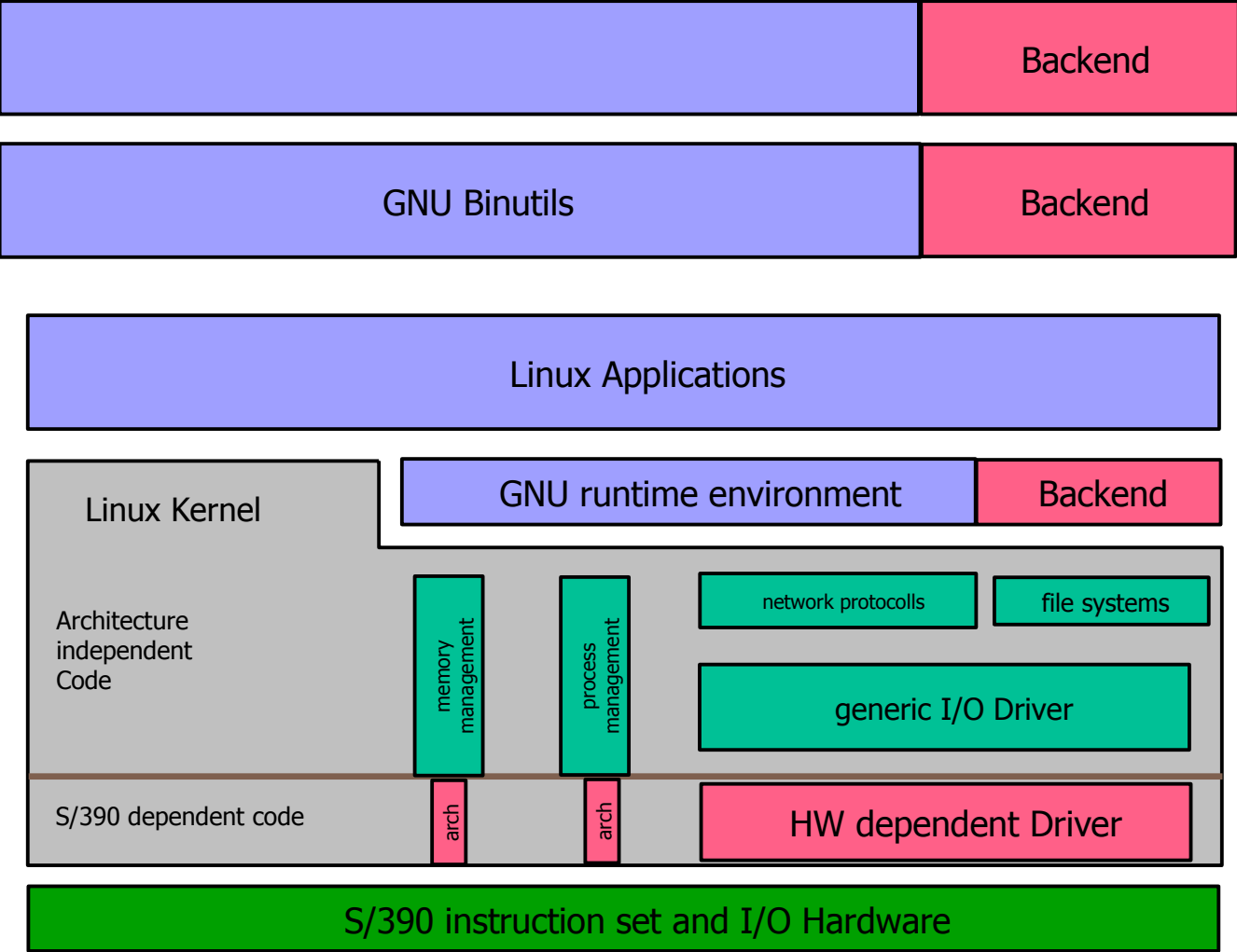


■ A different Culture: Bazaar

- ➔ flexible (re-) organization
- ➔ dynamic processes
- ➔ contents always up-to-date
- ➔ all tasks in parallel
- ➔ no idling
- ➔ designed by participants



Linux for S/390 Systemstructure



Linux for S/390

→ Concept of Platform Independence Proven

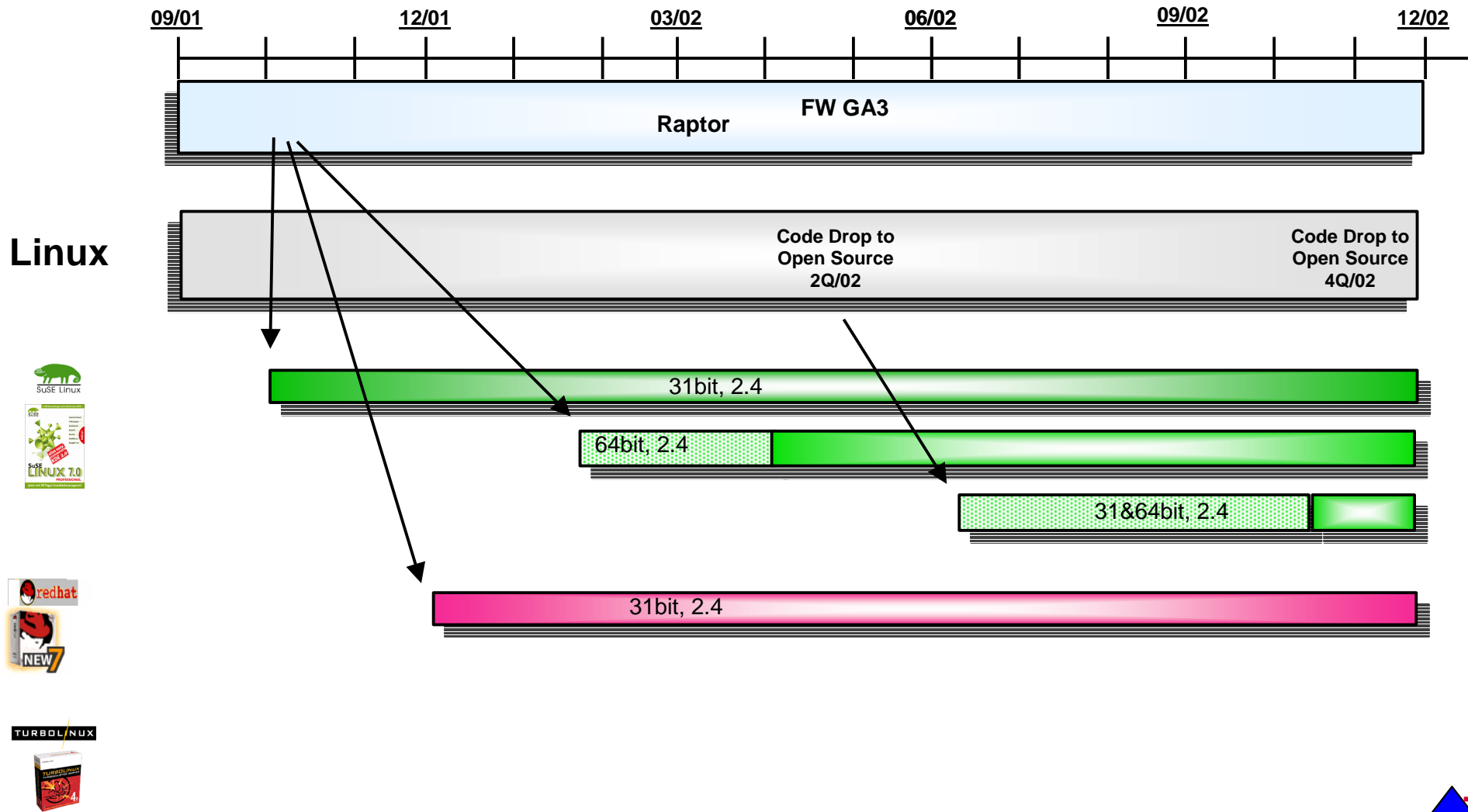
- Open Source Products
- IBM Middleware
- Vendor Products

→ Porting means in general: Translate Sourcecode and Run

→ Culture still to be embraced

package	total	zSeries	relative
kernel	1,500,000	160,000	10.7%
gcc	1,300,000	12,000	0.9%
glibc	1,200,000	9,000	0.8%
gdb	1,200,000	5,000	0.4%
binutils	800,000	6,000	0.8%
strace	27,000	200	

Linux on zSeries - Distributions



Middleware Support

2.4 Kernel/glibc 2.2, 31 bit

DB2 UDB (incl. DB2 Connect)

CICS Transaction Gateway

IMS Connect

MQ Client (C) / Server (S)

Java JDK

WebSphere

Commerce Suite Pro Edition

Portal Enable Solution

Edge Server

Tivoli TSM Client (C) / Server (S)

Tivoli Policy Director

Lotus Domino Enterprise Server

4Q01	1Q02	2Q02	3Q02	4Q02	1Q03
V7.2		V8			
		V4			
V1.1					
V5.2 C				V5.3 S	
V1.3.0	V1.3.1				
		V4.0.3	V5		
			V5.2		
		V4			
		V4			
		V4.2 C			V4.2 S
		V4.0			
Colour coding: available in plan under consideration					

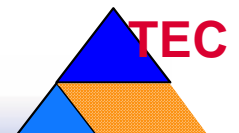
Linux for S/390 and zSeries Solutions

Open Source Applications/Tools

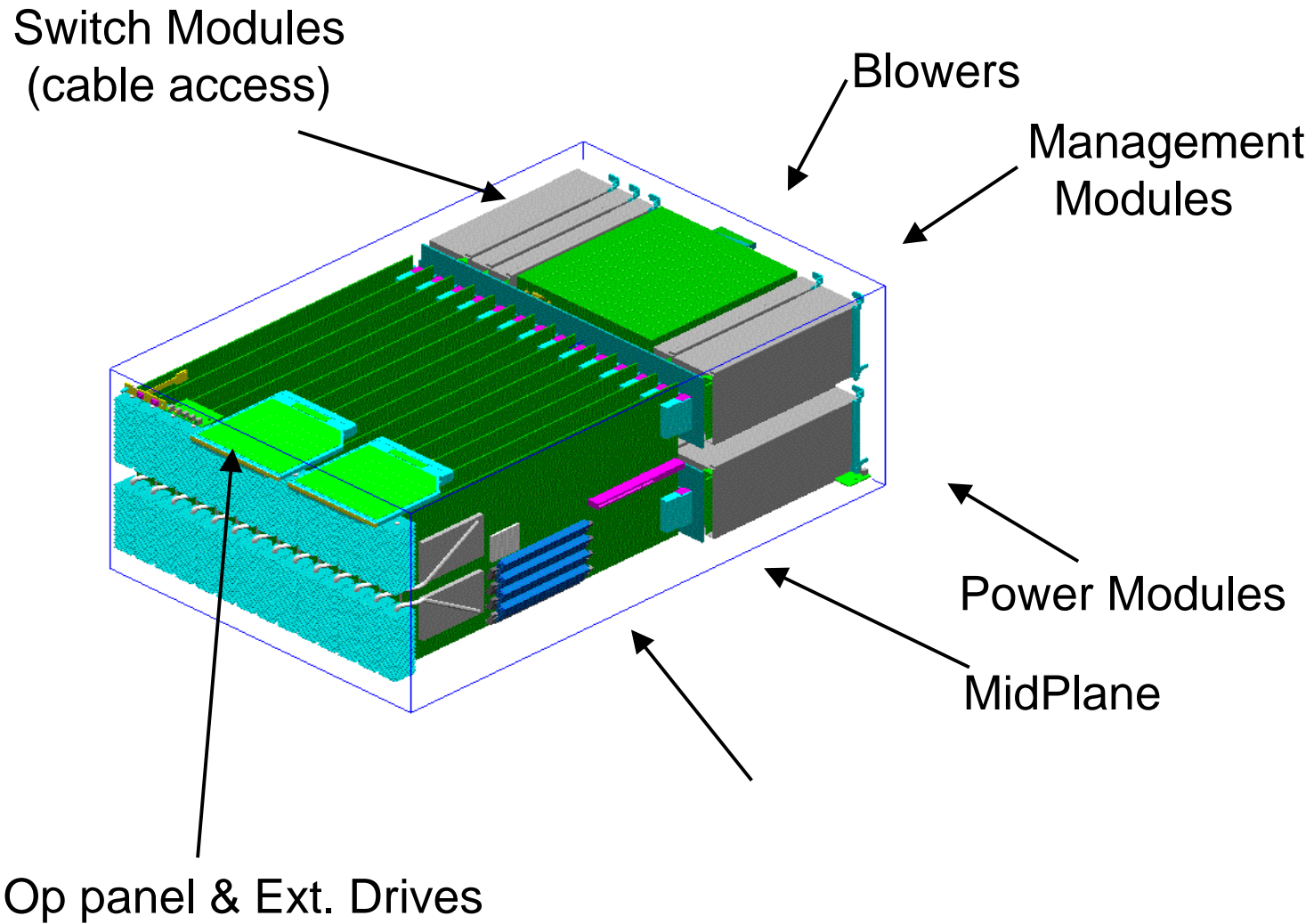
Apache	SQUID (www cache)
Perl	KDE
SAMBA	Gnome
IMAP/POP	X Windows
Sendmail	GNU Development Environment
OPEN SSL	

Commercial Vendors

- SAP	SendMail
- Software AG	Logics Software
- BMC	RTS Realtime Systems
- CA	ORACLE
- Macro4	BEA Logics
- Saga	TIPCO
-	



Blade Center



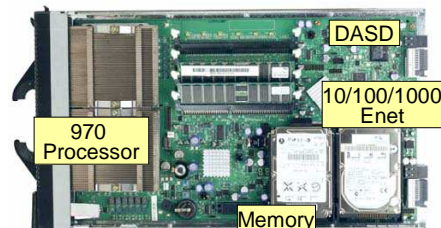
JS20: Power PC based Blade Server

the first high-volume POWER Linux product

High Volume
POWER

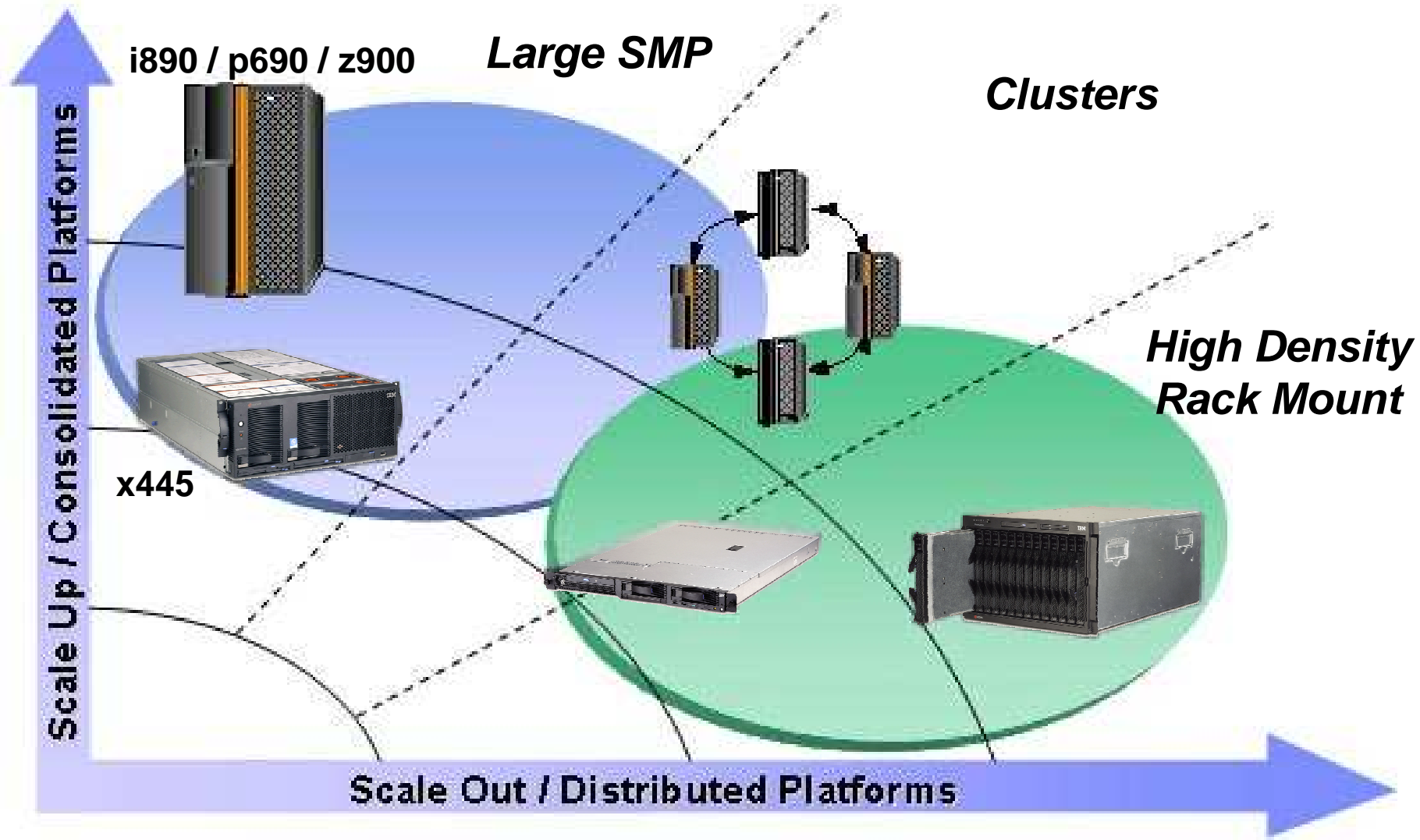
- **Power-based blades add the value of POWER4 to BladeCenter**
 - ▶ New Entry price point for POWER
 - 64-bit POWER at IA32 price
 - ▶ Leadership price/performance
 - ▶ 64-bit Linux capability
- **POWER-based blades reinforce BladeCenter value**
 - ▶ Integration
 - ▶ Low management and operational costs
- **Power-based blade has leadership performance with new VMX technology**

JS20 BladeServer
1 BladeCenter
slot



BladeCenter
7 EAI x 17.5"W x 28"D

Emerging IT Landscape



Linux OS Family

