
SoftSERCANS and SERCOS interface Competency Centers

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Overview

- **Introduction**
- **Advantages of Open Control Systems**
- **Importance of PC-based Control Systems**
 - Real-Time Platforms
- **Standardized Open Drive Interfaces**
- **Evolution of SERCOS interface**
 - SERCOS interface - SERCANS - SoftSERCANS
- **Competency Centers**
- **Summary and Outlook**

Importance of Open Control Systems



What is an Open System ?

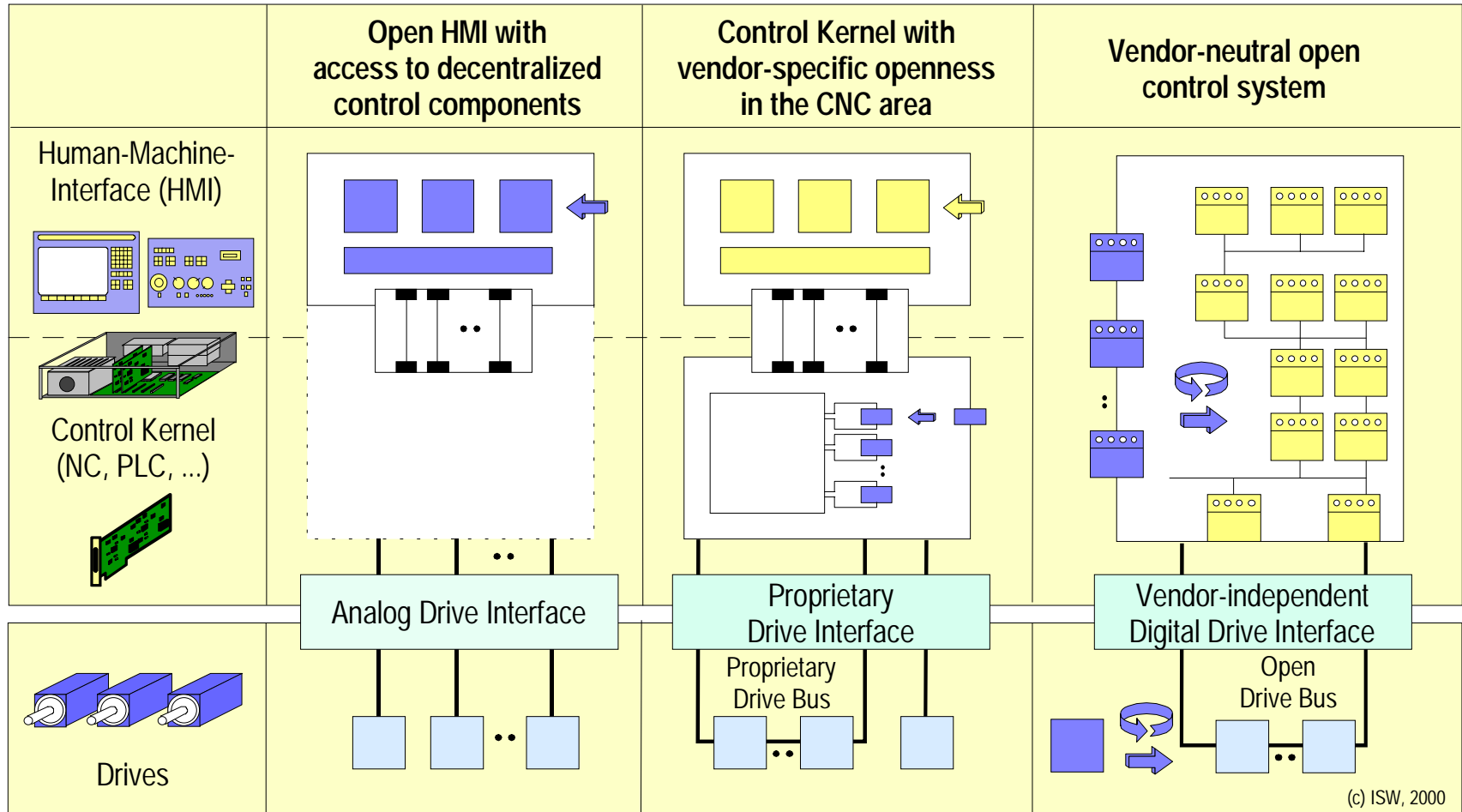
IEEE:

"An open system provides capabilities that enable properly implemented applications to run on a variety of **platforms from multiple vendors**, **interoperate** with other systems applications, and present **a consistent style** of interaction with the user."

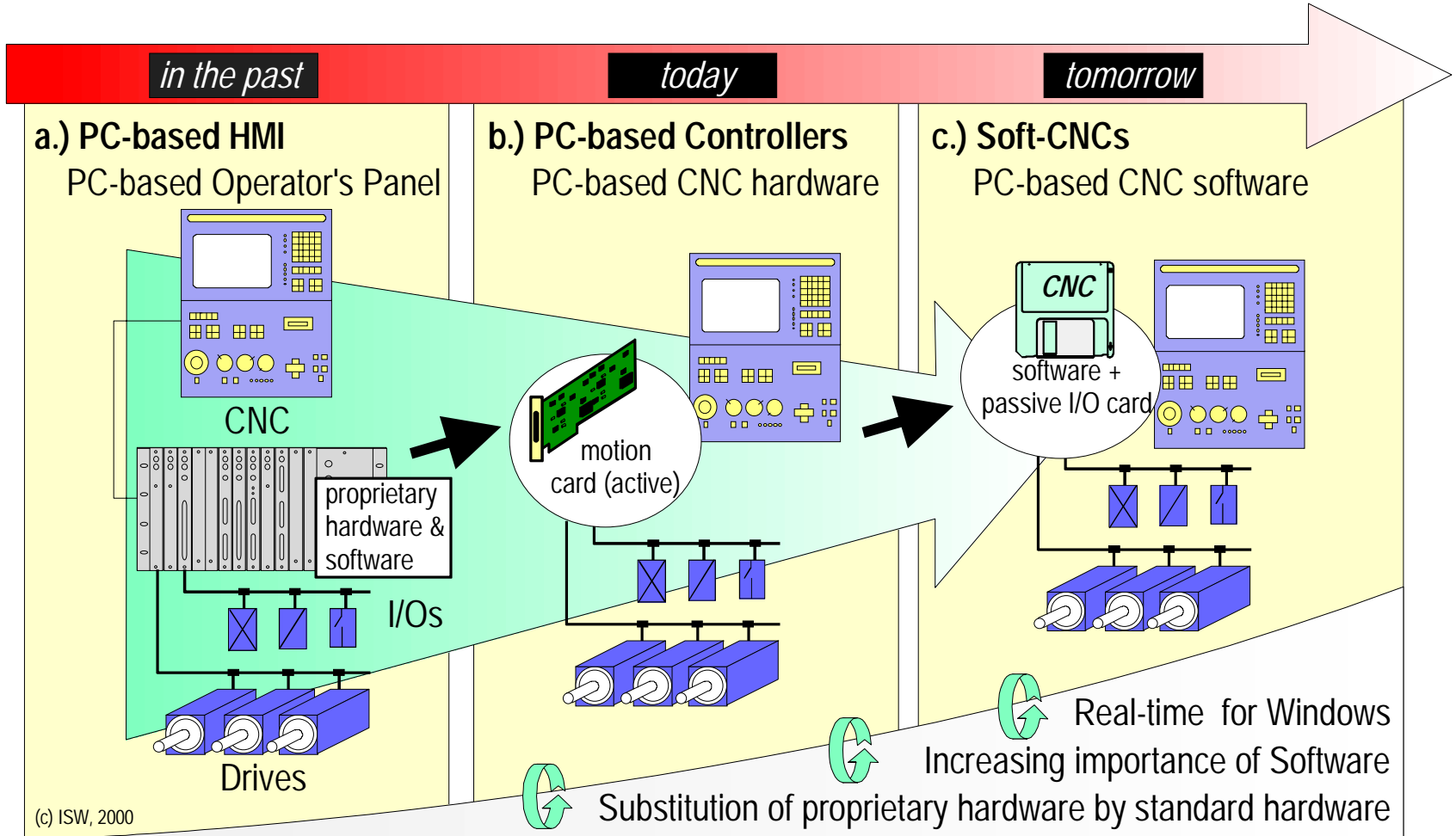
Characteristics:

- **vendor-neutral** independent of a single proprietary interest
- **consensus-driven** controlled by a group of vendors and users
- **standards-based** distributed widely in the form of standards
- **freely available** at no cost to any interested party

Categories of Open Interfaces for HMI, CNC and Drives



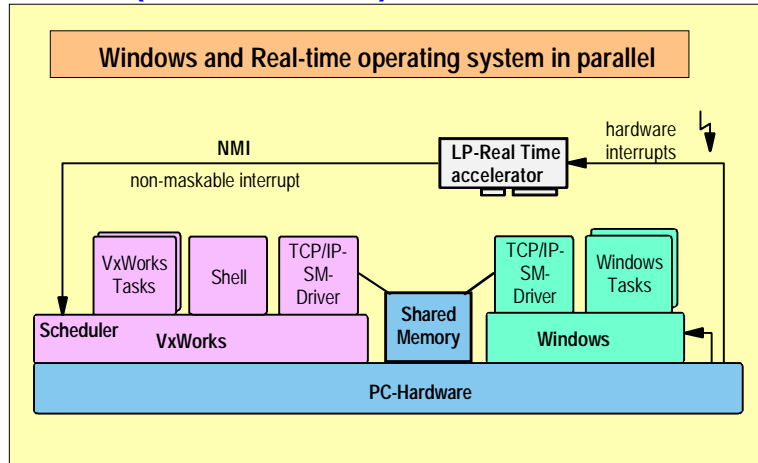
Use of PC technology in Automation Business



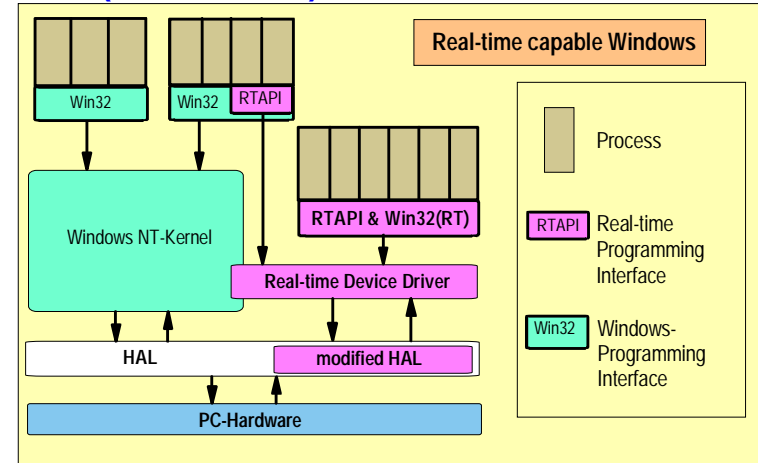
HMI: Human-Machine Interface

Real-time for Windows

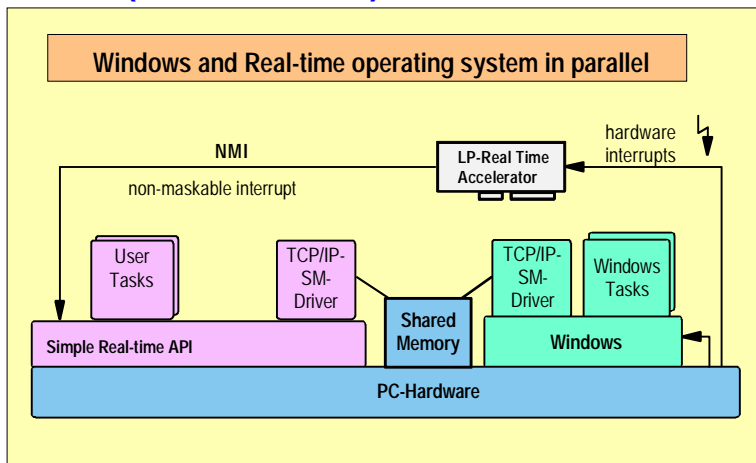
VxWin (LP Elektronik)



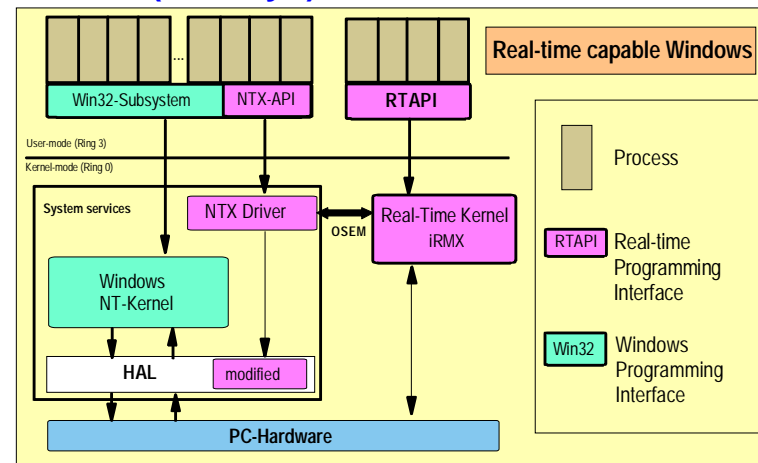
RTX (VenturCom)



RtWin (LP Elektronik)



INTime (RadiSys)



Comparison of Open Drive Interfaces



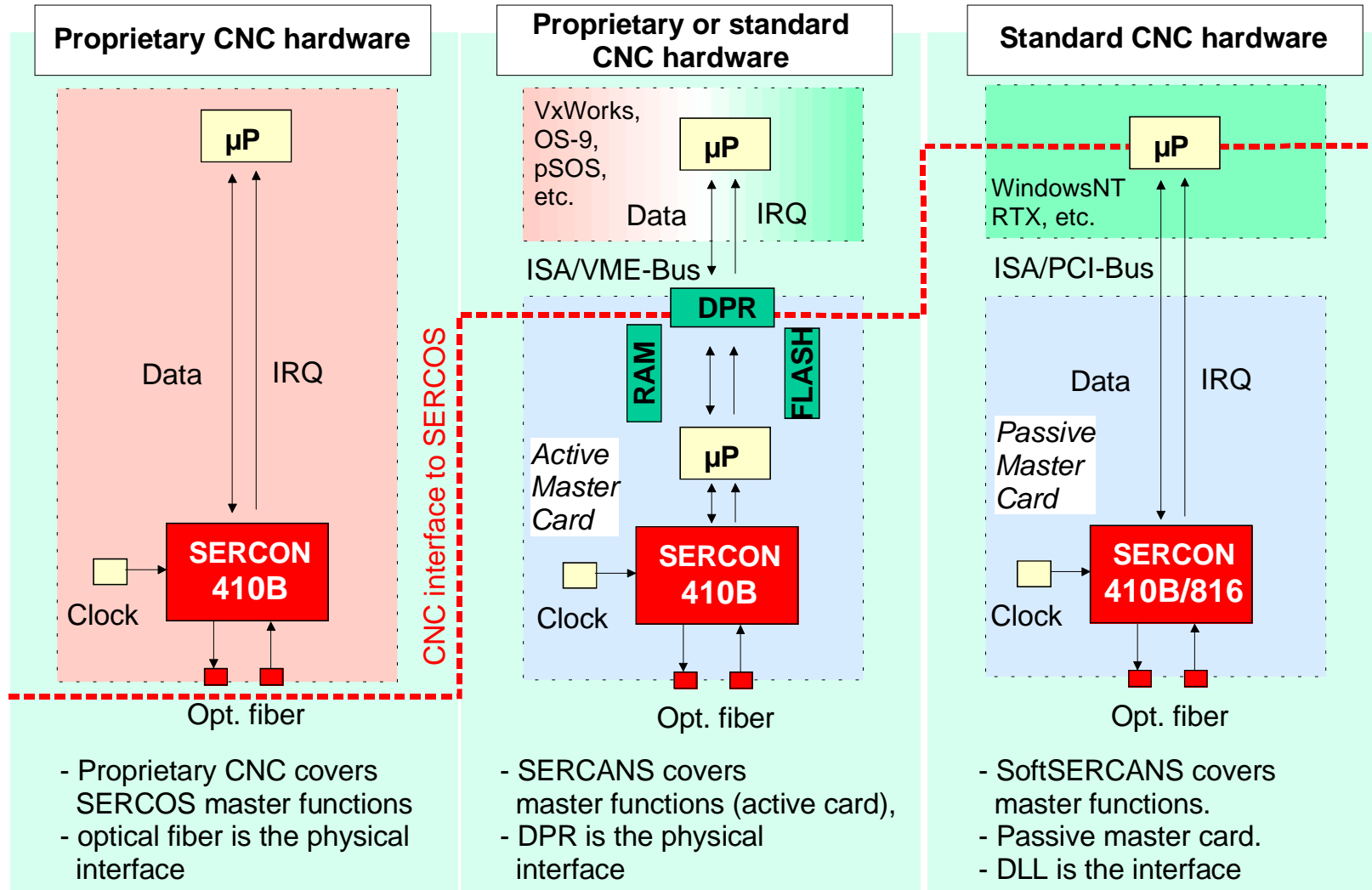
Drive Interface	Analog Velocity $\pm 10V$	Field bus CAN/CANOpen	SERCOS ⁱ
Wire Connections	min. 12 per axis	2 per axis	2 fiber-optic per system
Noise	high	low	very low
Quantization / Drift	yes	no	No
Max. Data Telegram Size	n/a	8 Bytes	80 Bytes (configurable)
Command Value Resolution	16 Bit	32 Bit	32 Bit
Max. Transmission Rate	16 kHz or higher	1 Mbit/s	16 Mbits/s (with SERCON 816)
Max. Command Update	high	low* (≈ 4 ms)	medium* (≈ 0.5 ms)
Deterministic	yes	no (asynchronous)	Yes (synchronous)
Synchronization Accuracy	low **	low	high (\approx few μ s)
Hardware-Interface Availability	wide	wide	growing
Software Driver Availability	wide	growing	growing (e.g. SoftSercans)
Intelligent Servo-Drive Availability	n/a	small	growing

* Depends on number of drives

** Synchronization usually sequential.

The absolute achievable accuracy depends on the programming technique used.

Evolution of SERCOS interface



- Proprietary CNC covers SERCOS master functions
- optical fiber is the physical interface

- SERCANS covers master functions (active card),
- DPR is the physical interface

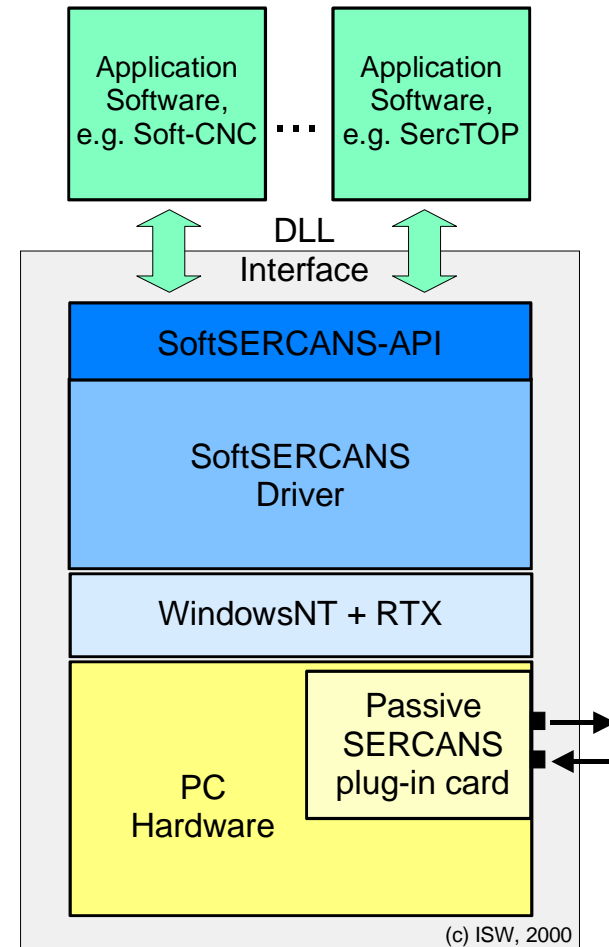
- SoftSERCANS covers master functions.
- Passive master card.
- DLL is the interface

(c) Rexroth Indramat

Characteristics of SoftSERCANS

Characteristics of SoftSERCANS

- Application Software can be written in the **programming languages C, C++ and Pascal**
- SoftSERCANS provides a **DLL interface** to reduce the complexity for the programmer
- SoftSERCANS driver is **free available** in object code
- SoftSERCANS works exclusively with WindowsNT plus **RTX of VenturCom**
- SoftSERCANS automatically **adapts to the performance** of the used PC hardware
- SoftSERCANS works with several **passive SERCANS cards** (price approx. 200 US\$)



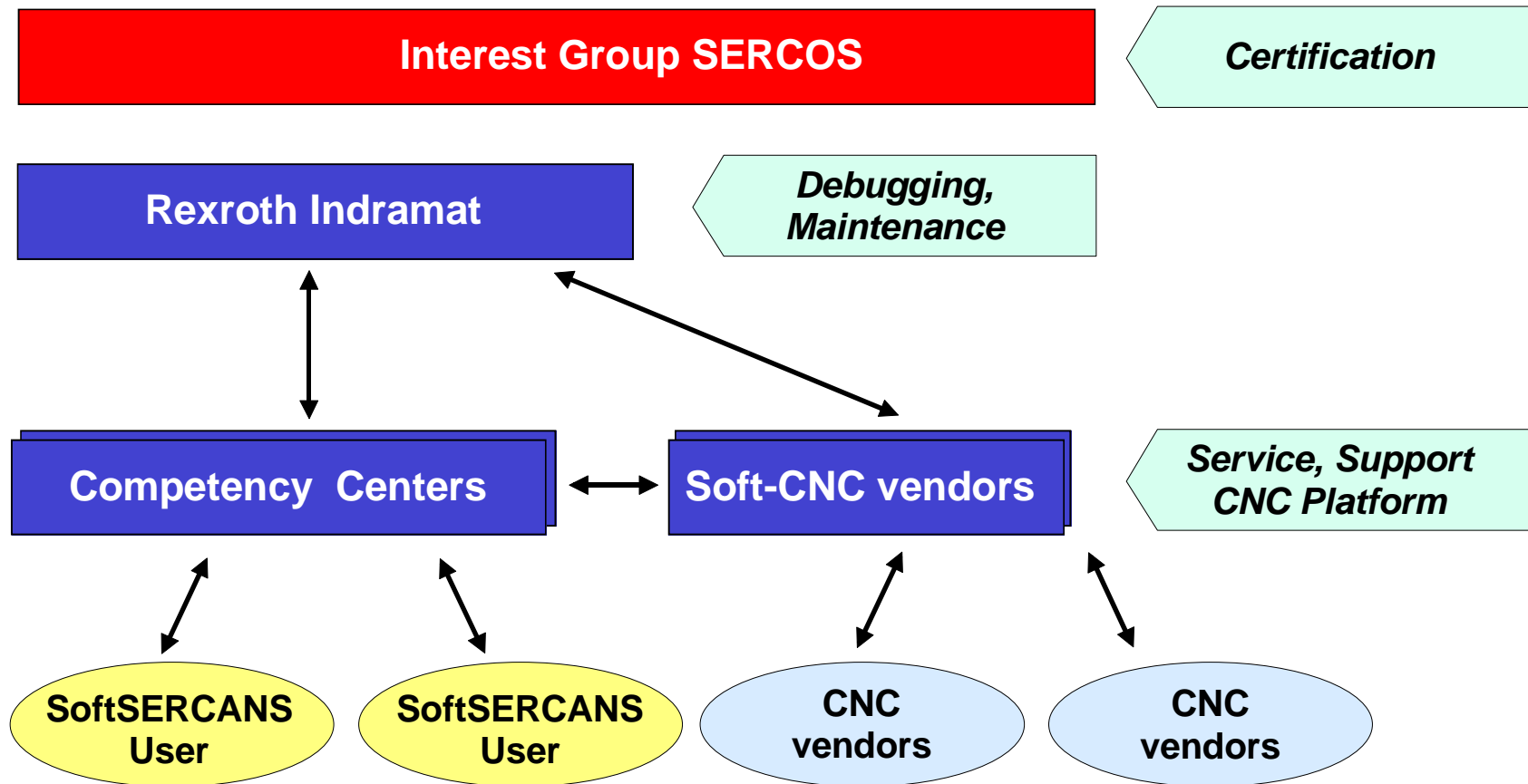
Capabilities of SoftSERCANS

Maximum number of axes	40 axes
Minimum SERCOS cycle time	0.5 ms
Maximum number of axes by 1 ms cycle time	8 axes ¹⁾
Maximum number of axes by 2 ms cycle time	18 axes ¹⁾
CPU resource requirement	< 10% ²⁾
Memory requirements	
- Real time kernel:	512 kB
- DLL:	132 kB
Determinism of the SERCOS system:	200 ns
System Requirement	Microsoft Windows NT 4.0 min.32 MB (64 MB recommended) VenturCom RTX V4.2 or higher
Recommended programming environment	Microsoft Visual C++ V5.0 Debugger Numega Softice V3.2 or higher

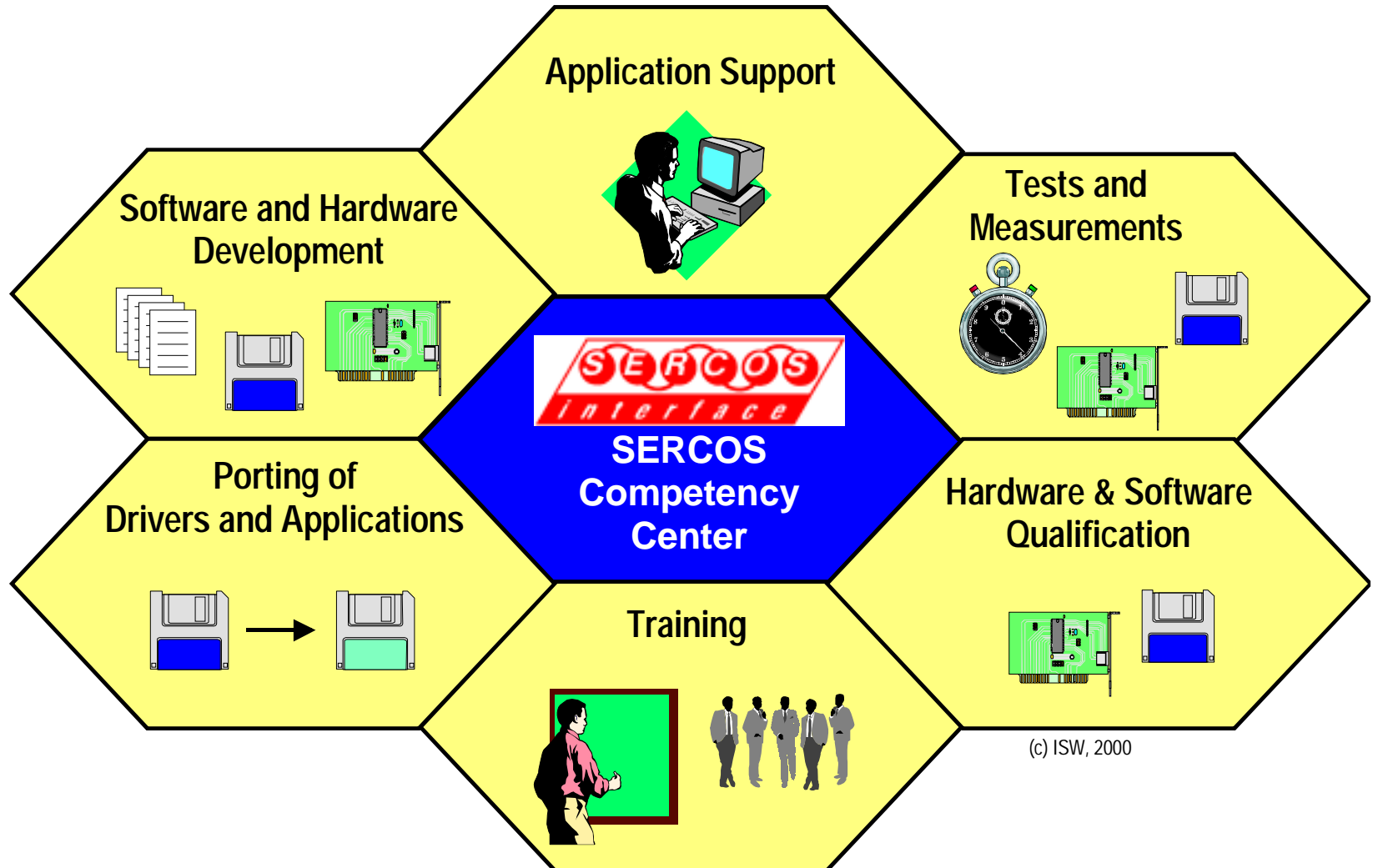
1) Pentium 200 and SERCOS transfer rate 4 Mbit/s

2) Pentium 200, 1 ms cycle time and 8 axes by position command

SoftSERCANS Infrastructure



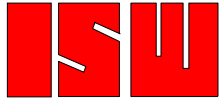
Competency Centers



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