Optima

Upgrade Solution using S57-II CPU

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S5 System

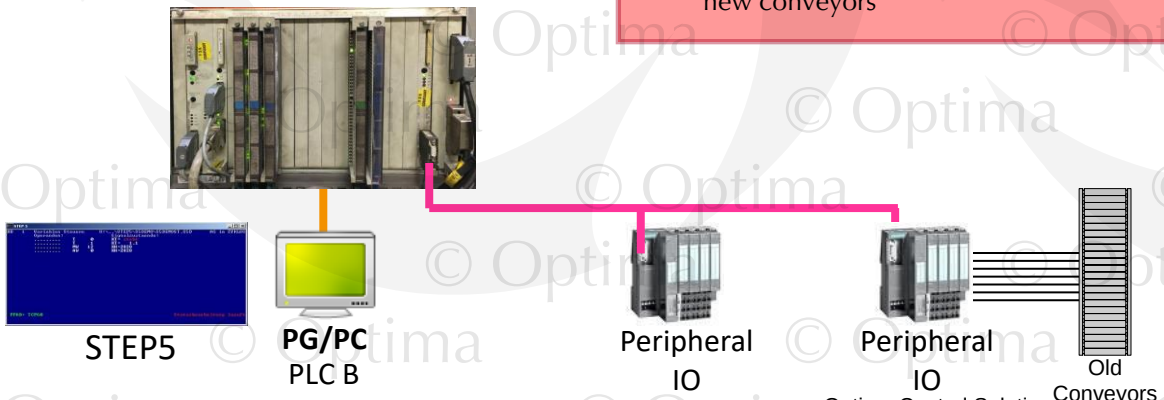
Status:

- Simatic S5 SPS-System 135U
  - Master Racks CPU is 928B
- Serial or limited comms to the existing PLC system – difficult to upgrade SCADA
- Short timescales available for upgrade route

Reason for upgrade:

- Adding new conveyor systems to a system eventually running on a S7-1516-3 PN/DP PLC
- In the interim, these new conveyors need to be controlled from the S5 PLC
- Need to map data across from the S5 to the new conveyors

SINEC H1
PROFIBUS
Ethernet
PROFINET



STEP 1

PG/PC STEP5
via Serial

- Program taken from existing processor and installed in the S57-II CPU. Fully tested off-site for program operation
- The power to the existing control will be switched off, the CPU928B will be replaced with S57-II CPU. Time < 5 minutes
- Connection to factory TCP/IP network via one of the **4 available** Ethernet processors is now available!
- Test run with the S57-II CPU
- All this possible in a short shutdown schedule to fit in with your requirements

Serial / AS511
SINEC H1
PROFIBUS
New Ethernet
PROFINET

Ethernet **TCP/IP**

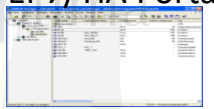
SCADA
PLC B

Immediate Benefits

- Short changeover time
- The existing and reliable S5 program is retained with minimal modifications (only those related to the S57-II CPU installation)
- Shorter scan-cycle times (see table below) typically **10x faster** than the highest-specification S5 processor
- 4 Ethernet communication processors available, high-speed access to program data variables is available with no disruption to S5 or S7 scan cycle times
- New SCADA system can be implemented and tested with no disruption to existing SCADA systems or other plant communications

S5 Program operations	S57-II CPU	S5 CPU 948	S5 CPU 945
Bit/Word Operations	10 ns	180 ns	100 ns
Fixed Point Arithmetic	10 ns	500 ns	350 ns
Floating Point Arithmetic	10 ns	3330 ns	1350 ns
S7 Program operations	**S57-II CPU**	**S7 CPU 417**	**CPU 1516-3 PN/DP**
Bit/Word Operations	10 ns	18 ns	10 ns
Fixed Point Arithmetic	10 ns	18 ns	16 ns
Floating Point Arithmetic	10 ns	54 ns	64 ns

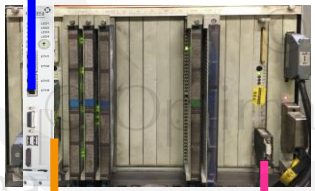
STEP 2

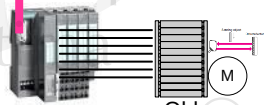


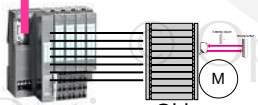
- Programming functions in S5 **and** S7/Portal now available via **Ethernet**
- Variables of S5 data area are immediately available and addressable via WinCC, WinCC Flexible running the **standard** Siemens protocol or indeed any other SCADA system running a **standard** Siemens OPC server protocol
- Preferably, new data structure DB's in S7 can be created for the data to be logged and block copied across from the S5 domain. **This removes the need for re-engineering post S7-conversion**
- All this with **no modification required** to the S5 program – very low risk

SINEC H1
PROFIBUS
New Ethernet
PROFINET

Ethernet **TCP/IP**



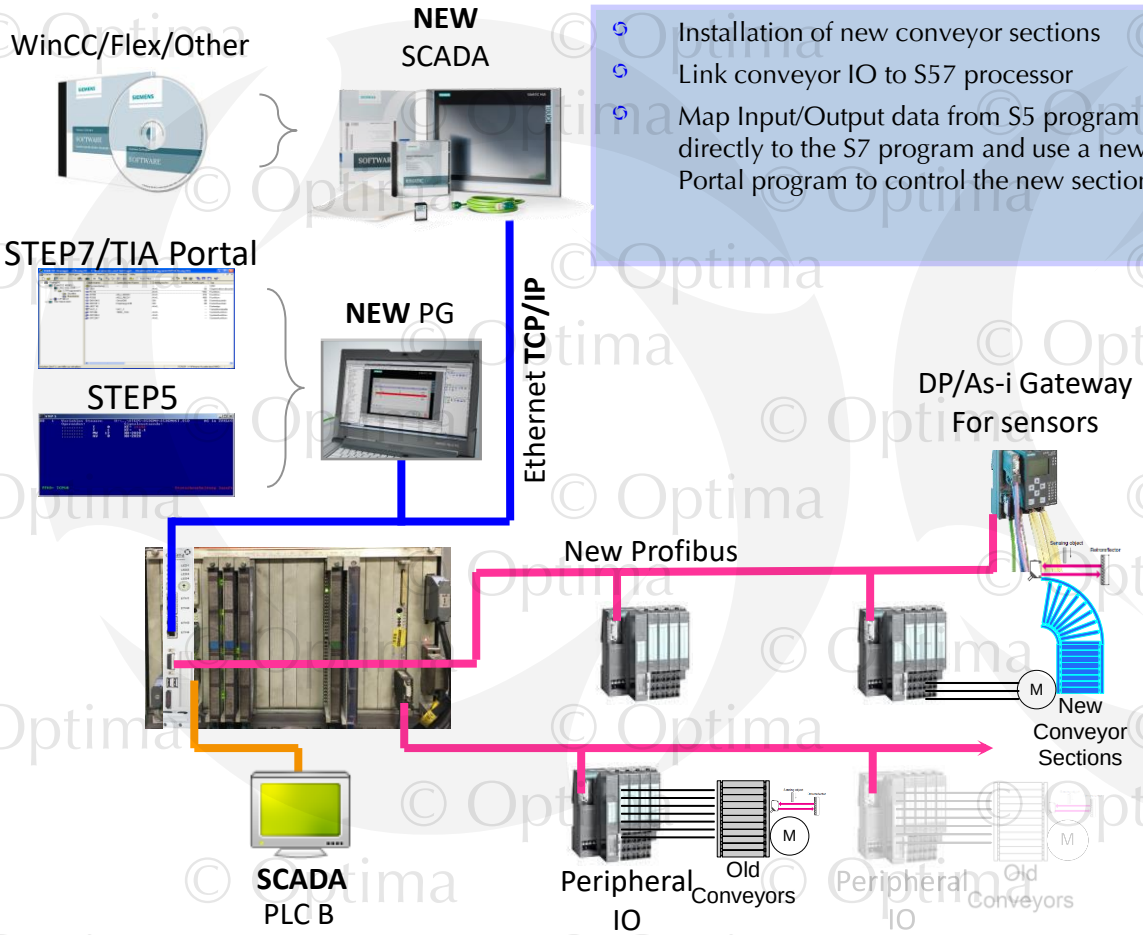




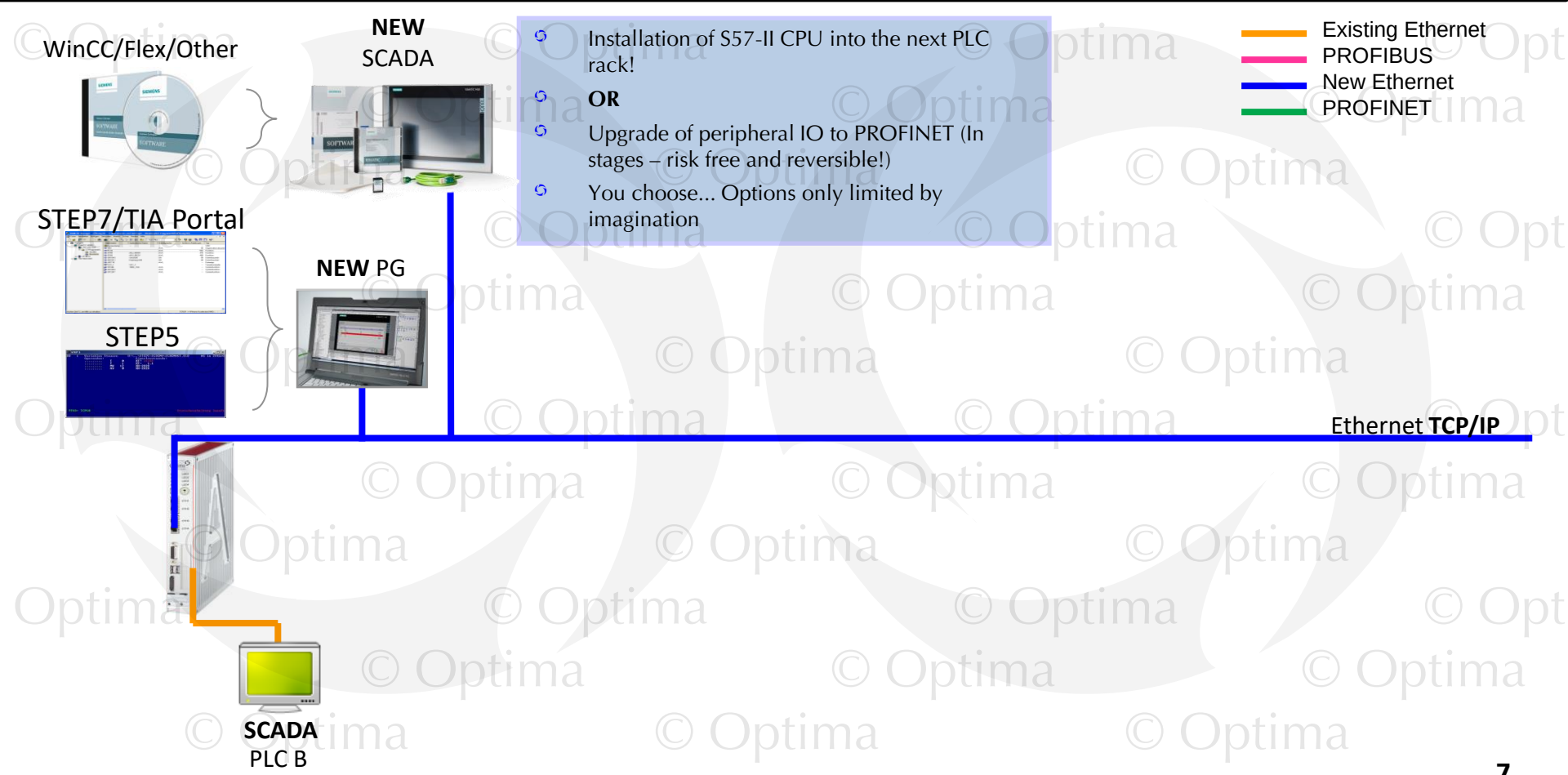
STEP 3...

- Installation of new conveyor sections
- Link conveyor IO to S57 processor
- Map Input/Output data from S5 program directly to the S7 program and use a new TIA Portal program to control the new sections

SINEC H1
PROFIBUS
New Ethernet
PROFINET



STEP ... to End



- Installation of S57-II CPU into the next PLC rack!
- **OR**
- Upgrade of peripheral IO to PROFINET (In stages – risk free and reversible!)
- You choose... Options only limited by imagination

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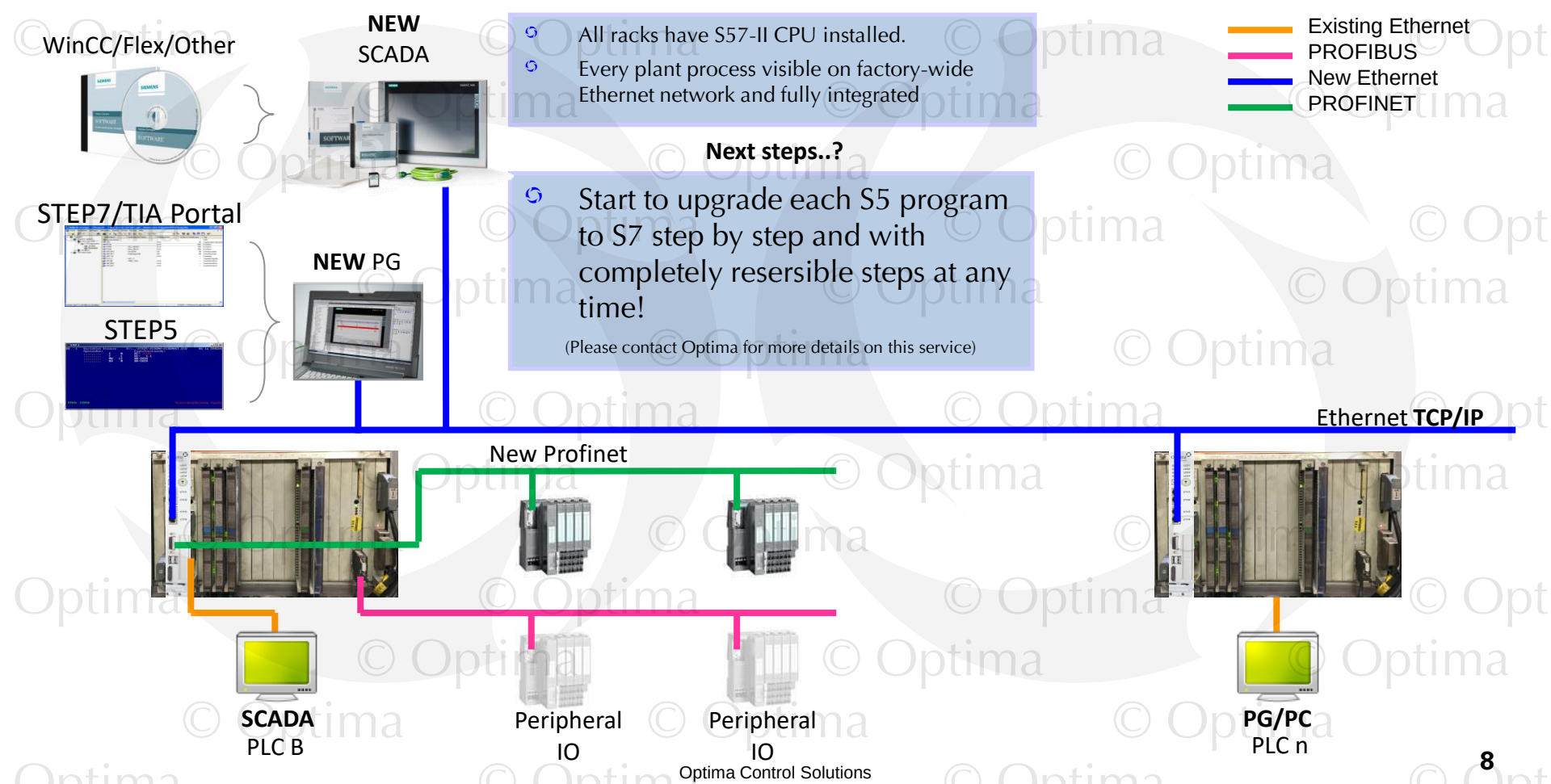
End


WinCC/Flex/Other
NEW
SCADA
All racks have S57-II CPU installed.
Every plant process visible on factory-wide Ethernet network and fully integrated
Existing Ethernet
PROFIBUS
New Ethernet
PROFINET
Next steps..?
STEP7/TIA Portal
NEW PG
Start to upgrade each S5 program to S7 step by step and with completely resersible steps at any time!
(Please contact Optima for more details on this service)
STEP5
Ethernet TCP/IP
New Profinet
SCADA
PLC B
Peripheral
IO
Peripheral
IO
PG/PC
PLC n