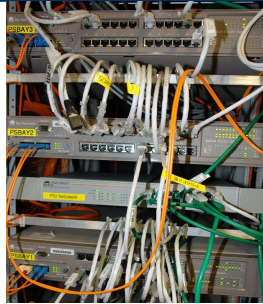
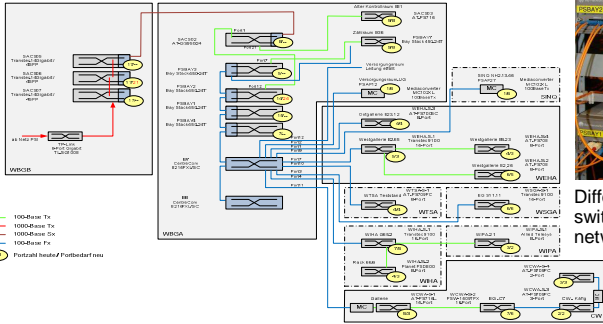


## High Intensity Proton Accelerator Controls Network Upgrade

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The High Intensity Proton Accelerator (HIPA) control system network is spread through a vast area in PSI and it has grown historically in an unorganized way. The miscellaneous network hardware infrastructure and the lack of documentation and components overview could not longer guarantee the reliability of the control system and the facility operation. Therefore, a new network, based on modern network topology, PSI standard hardware with monitoring and detailed documentation and overview was needed. We would like to present how we successfully achieved this goal and the advantages of the clean and well documented network infrastructure.

### Initial Situation – November 2010



Different flavour of network switches running in HIPA Controls network until the end of 2010.

#### Problems

- ⇒ Bottlenecks during data transfer
- ⇒ Lack of network overview, documentation
- ⇒ Non PSI standard network topology (cascade)
- ⇒ Difficult maintenance of network hardware components, no emergency stock
- ⇒ No central network administration, no monitoring
- ⇒ Non standard DHCP/DNS infrastructure

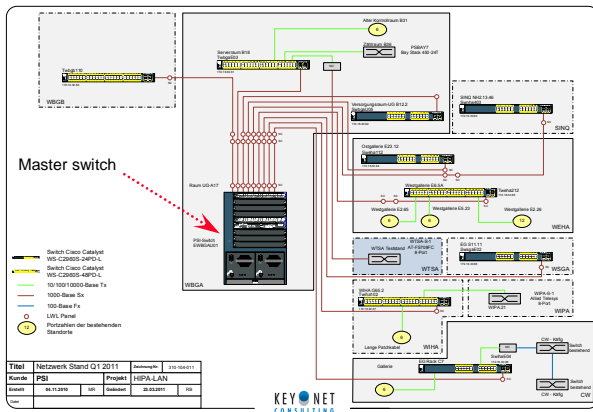
#### Goals

- ⇒ High available stable, scalable network
- ⇒ Improvement of network performance
- ⇒ PSI standard network topology and monitoring
- ⇒ Documentation should be useful for the facility operation

Topology of 25 network switches of various manufacturers in different buildings.

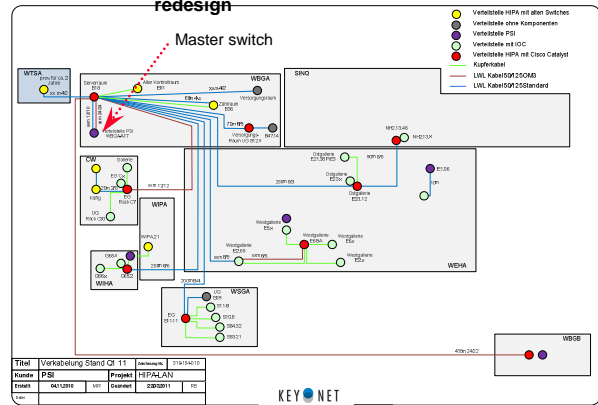
### Project Realisation

#### New network switches topology



Network star topology based using PSI standard components with central management and configuration.

#### New network layout after redesign



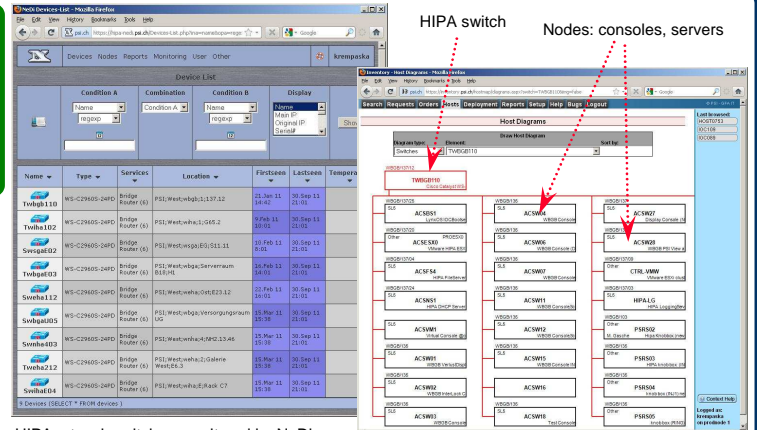
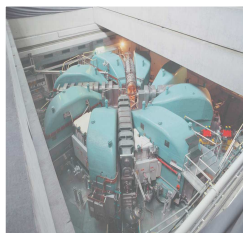
#### Main tasks

- replacement with 9 uniform switch components
- some new fiber optics connections
- patch panel cabling from switch to nodes

### Results



- ⇒ Network homogeneity
- ⇒ Performance improvements
- ⇒ Monitoring with NeDi
- ⇒ Documentation: diagrams, maps, reports, integrated with the Inventory software



HIPANetwork switches monitored by NeDi