



PHYSICAL LAYER MANAGEMENT DEPLOYMENT AT SWISSCOM

Swisscom becomes the first public network operator to recognise the value of Physical Layer Management integrated with NMC systems

Swisscom is the major incumbent operator in Switzerland operating Swisscom Fixnet – a fixed network with conventional copper and fibre-optic local loop distribution serving 3.8 million analogue and ISDN lines and 1.25million ADSL lines as well as Swisscom Mobile a latest-generation mobile communications network offering GSM, UMTS (3G), Edge and even HSDPA high speed data to more than 4.3 million mobile users.

Its network infrastructure for wired and mobile voice and data communications offers blanket coverage throughout Switzerland reaching remote locations and well as large conurbations.

“We enable the Swiss population to fulfil their communications needs in both their private and professional lives”, explains Reto Winteler, Network Operations and Maintenance Manager.

CASE STUDY

As evidence of its innovative nature, Swisscom Mobile has introduced advanced services like Xtra-sponsor, BlueWin AddressBook and MobileLabs.

Xtra-sponsor allows parents, grandparents, uncles and friends to 'sponsor' a youngster by automatically crediting the young person's mobile phone with an amount each month. Not only does the under 26 year old get their 'sponsorship' credit, they can make unlimited calls to their sponsor(s) even when their credit is zero! BlueWin address book gives customers a single on-line addressbook that constantly synchronises with their mobile and can be accessed by web as well as synchronised via the internet with their desktop or notebook computer. Not shy to let users know what they are planning, Swisscom's MobileLabs actually encourages users to trial Beta versions of new services – allowing earlier access to services and in return receiving valuable feedback, which can influence the final service, before it is taken mainstream.

As part of its constant drive to create an ever more effective and resilient infrastructure and to provide the flexibility it needs in order to offer so many innovative services, Swisscom is constantly reviewing new products to help manage and maintain its network.

Ethernet and IP now are at the heart of the majority of services offered by Swisscom. Recognising that, as with any cabling network, up to 70% of network downtime can be caused by faults in the physical layer – and that the physical layer is conventionally un-managed – Swisscom engineers were looking for a solution that would meet its challenging needs. "Documenting our infrastructure posed another problem", explains Winteler. "With a network as extensive as ours it's almost impossible to keep up to date with all the changes to the infrastructure, even with computerised recording, because it all relies on human record-keeping and manual input. This slows down maintenance and fault finding so a solution to this age old problem would improve our service levels, reduce downtime and reduce costs."



As months and years go by, every network undergoes hundreds or thousands of cabling moves, adds and changes (MACs), and inevitably record keeping can never keep up to date with 100% accuracy. Swisscom have now successfully trialled ADC KRONE PLM (physical layer management) system which solves this problem by doing away with manual record keeping. It does this by continuously scanning the network's physical connections and correlating this with information on connected Ethernet devices and device usage via SNMP from the various switches. It even identifies unused switch ports, redundant patch cords as well as underutilised ports where the connected device hasn't actually sent or received traffic for a specific amount of time – hours, days or weeks. All of this information – 100% accurate in real time – is available to engineers onsite and network managers in the Chur Network Operations Centre.

Explaining the investment in ADC KRONE PLM Winteler says, "Our colleagues at Swisscom Fixnet were evaluating a new Ethernet distribution frame system and had the ADC KRONE EDF frame together with the PLM Ethernet patching management system installed as a demo unit. We already use ADC KRONE fibre main distribution frame solutions and the FiberGuide system at Swisscom Mobile as do our colleagues at Swisscom Fixnet. When we realised that ADC KRONE produced Ethernet solutions with cable management features similar to their OMX Fibre solutions – a main distribution frame system for fibre optics – we were very interested. The benefits of having integrated remote controlled intelligent patching and management systems made the complete system even more attractive for us and so we decided to get a trial started as soon as possible at some dedicated Swisscom Mobile sites", says Winteler

ADC KRONE was then invited to present both its EDF Ethernet distribution frame system and its PLM physical layer management system. "We were impressed by the way the panels handled and stored the patch cables", says Winteler. "It was neat and compact yet contained a high density of cables that could be a mix of Cat 6 and, if needed, fibre too. It was a very effective solution for our mobile exchanges where space is at a premium."

What impressed Swisscom even more was the demonstration of the PLM system. Providing an intelligent solution to monitor the whole physical cable and fibre infrastructure from a central point it delivers information on line connections and terminations as well as offering a planning tool for the whole network. "While, like all major network operators we had network management software tools for all of the active equipment, never before had we been able to electronically monitor the

cabling plant – let alone integrate that with the active equipment management.”

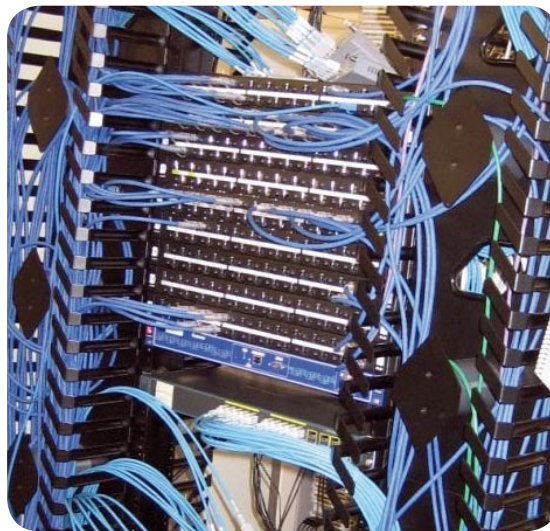
Without further deliberation Swisscom immediately ordered ADC KRONE PLM at five data centres as a pilot scheme. These were installed for its mobile exchanges at two sites in Zurich, two further sites in Lausanne and one at Bern. The central PLM server was located at the Network Operations Centre in Chur.

Once all of the equipment was installed on site ADC KRONE engineers set about configuring the system to the Swisscom network.

“Seeing our initial trial system operational was the first time that we had really seen the PLM system working and the benefit of trying out the PLM system in house was that it was configured for our own network”, explains Winteler. “So we were familiar with the equipment names, building locations and the network equipment that was being presented, which made it real and very impressive.”

Initial training on the PLM system was completed in just two days using the installed system to demonstrate the features, functions, capability and power of physical layer management. Working with small groups of up to four systems engineers, Swisscom was able to gain hands-on experience of working with its real and live network. “The PLM management module runs as a web client, so that our engineers were able to learn about managing the system using their own laptops connected into the central PLM management tool”, explains Winteler. “This was as near to our real working practice as we could get and in the two days they mastered all the major elements of the tool. There are still advanced features and facilities that we haven’t yet fully explored, like the ability to set thresholds so that, for example, if no traffic is seen on a particular link for a specified number of minutes then an alarm could be raised – but the use of these powerful features will come in time as we all get more familiar with the functionality.”

Taking less than three months from initial decision to full installation of the five operational trial sites, Swisscom has already seen the benefits of intelligent physical layer management. “For the first time we have a complete overview and up to date documentation of our physical Ethernet infrastructure on all of the test sites”, says Winteler. “If somebody changes part of the active network, we now know about it immediately. If a piece of network equipment is disconnected or fails – we know about that immediately. PLM management gives us those vital additional tools that help to make the network more robust and secure. And even though the data centres are in different



cities we have the real time information available in our national Network Operations Centres as well as locally – immediately.”

The initial five site operational trial was such a great success that Swisscom has standardised on the use of intelligent physical layer management using PLM. Today there are already fifteen Swisscom Mobile locations that have been equipped with the ADC KRONE Ethernet frame and PLM system and expansion to 45 data centres is already planned.

At each site, the configuration is identical: one EDF Ethernet distribution frame with cable management equipped with six PLM managed patch panels, one PLM scanner together with all the required NE (network equipment) cables and the special ‘9th wire’ patchcords which allow the scanner to determine constantly which ports the patch cord interconnects. “This means that whenever anyone moves a patch cord, the system knows immediately and our records stay up to date,” explained Winteler. “Also, when we need MACs performing, the system issues the work ticket to the technician and then indicates by LED lights exactly which patch cord to remove and where to replace it. It even raises an alarm if a patch cord is wrongly inserted. It removes all the opportunities for error.”

Up to date documentation and management of its network allows Swisscom to develop its next generation network to deliver additional services more easily. “It’s essential to have this level of overview and detail especially as the network gets more complicated”, states Winteler. “The PLM intelligent physical layer management system from ADC KRONE will undoubtedly allow us to build even more complex networks to deliver yet better services to our customers – with higher reliability and availability than ever before.”

SWISSCOM MOBILE AG

With a market share of 62% of business in force and 69% of new customers in 2005, Swisscom Mobile is the market leader in the Swiss mobile communications sector. In fiscal year 2005, Swisscom Mobile generated net revenue of CHF 4,168 billion and now has more than 4.3 million NATEL subscribers. The company operates a nationwide GSM network (900/1800 MHz), which was enhanced with EDGE in spring of 2005. With HSDPA, Swisscom Mobile is the first network carrier in Switzerland to roll out a turbo network. Launched in February of 2006, it is already about five times faster than a UMTS network. This means its speed is comparable to that of an ADSL connection. Already today, Swisscom Mobile provides coverage of around 90% of the populated area of Switzerland through its UMTS network as well as wireless LAN-Internet access through more than 1000 hotspots.

This unique technology mix is the basis for a comprehensive mobile broadband network that enables high-quality mobile communication services. Swisscom Mobile launched UMTS-based services in November 2004, including live TV and video telephony. Its Mobile Unlimited PC Card supports automatic, seamless and high-speed mobile connections to the Internet.

By the way, Natel® subscribers are not only reachable anywhere within Switzerland but, with over 400 roaming partner networks, all over the world.

www.swisscom-mobile.ch

ABOUT ADC KRONE

ADC serves its customers as ADC KRONE in the Europe/Middle East/Africa, Asia, and Indo-Pacific regions of the world. ADC KRONE provides the network infrastructure equipment and professional services needed to deliver voice, video, Internet and data communications around the world. Wireline, wireless, cable, enterprise, and broadcast network operators rely on ADC offerings to deliver bandwidth intensive, high-speed services to residential, business and mobile subscribers. ADC (NASDAQ: ADCT) has sales into more than 140 countries.

Learn more about ADC KRONE at www.adckrone.com/en

CASE STUDY



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UK Office: ADC Communications (UK) Ltd., Runnings Road, Kingsditch Trading Estate, Cheltenham, Gloucestershire GL51 9NQ, United Kingdom • Phone: +44 (0) 1242 264 400 Fax: +44 (0) 1242 264 488 Email: contactuk@adckrone.com

South African Office: ADC Telecommunications (Africa) PTY Ltd., 16 Brand Hatch Close, Kyalami Business Park, Midrand, 1685 Johannesburg, South Africa • Phone: +27 11 466 3333 Fax: +27 11 466 3300 Email: infos@adckrone.com

EMEA Office: ADC GmbH, Beeskowdamm, 3-11, 14167 Berlin, Germany • Phone: +49 30 8453 1818 Fax: +49 30 8453 1703. For a listing of all ADC KRONE's global sales office locations, please refer to our web site.

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